

2022 Clean Watersheds Needs Survey Report to Congress

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Contents

| | |
|--|-----------|
| 1. Introduction | 1 |
| 2. Scope and Methods | 3 |
| Policies | 4 |
| Documentation | 4 |
| Planning Documents | 5 |
| State-Specific Approaches | 5 |
| Cost Estimation Tools | 5 |
| Small Community Form | 5 |
| 3. Data Quality Assurance | 6 |
| Technical Data Review | 7 |
| Needs Data Review | 7 |
| 4. Results: National Needs | 7 |
| 5. Changes Since 2012 | 14 |
| 6. 2022 Needs by CWNS Category | 16 |
| Secondary Wastewater Treatment (Category I) | 16 |
| Highlights | 16 |
| Discussion | 17 |
| Advanced Wastewater Treatment (Category II) | 18 |
| Highlights | 18 |
| Discussion | 18 |
| Conveyance System Repair (Category III) and New Conveyance Systems (Category IV) | 19 |
| Highlights | 19 |
| Discussion | 20 |
| Combined Sewer Overflow Correction (Category V) | 20 |
| Highlights | 20 |
| Discussion | 21 |
| Stormwater Management (Category VI) | 21 |
| Highlights | 21 |
| Discussion | 22 |
| Nonpoint Source Control (Category VII) | 23 |
| Highlights | 23 |
| Discussion | 23 |

| | |
|---|-----|
| Water Reuse (Category X) | 25 |
| Highlights | 25 |
| Discussion..... | 25 |
| Decentralized Wastewater Treatment Systems (Category XII) | 26 |
| Highlights | 26 |
| Discussion..... | 27 |
| Desalination (Category XIV)..... | 27 |
| Highlights | 27 |
| Discussion..... | 28 |
| 7. Urban and Rural Area Needs..... | 28 |
| Small Community Wastewater Needs | 29 |
| Appendix A: 2022 CWNS Needs Categories Definitions | A-1 |
| Appendix B: 2022 CWNS Reported Needs by Category..... | B-1 |
| Appendix C: Total Needs by State for 2008, 2012, and 2022 | C-1 |
| Appendix D: 2012 CWNS Reported Needs by Category | D-1 |

List of Figures

| | |
|---|----|
| Figure 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)..... | 8 |
| Figure 2. Distribution of Total Reported Needs by State (January 2022 Dollars in Billions) | 10 |
| Figure 3. Distribution of Per Capita Reported Needs by State (January 2022 Dollars/Person) | 11 |
| Figure 4. Total Reported Needs Nationwide for the 2008–2022 CWNS by Category (January 2022 Dollars in Billions) | 16 |
| Figure 5. Percent of Stormwater Needs by Subcategory in 2012 and 2022 | 22 |
| Figure 6. Number of Reported Reuse Discharge Types in 2022 and 2042 ¹⁷ | 26 |
| Figure 7. Population Served by POTWs for Select Years Between 1940 and 2022 and Projected (If All Needs Are Met) by Treatment Level | 32 |

List of Tables

| | |
|--|-----|
| Table 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)..... | 9 |
| Table 2: Total and Per Capita Reported Needs by State | 12 |
| Table 3. 2008–2022 CWNS Total Needs by Survey Year (January 2022 Dollars in Billions)..... | 15 |
| Table 4. NPS Control Needs by Subcategory | 24 |
| Table 5. 2022 CWNS Small Community Wastewater Needs by Category (January 2022 Dollars in Billions).... | 29 |
| Table 6. Changes over Time in POTW Discharge to Surface Water | 33 |
| Table A-1. 2022 CWNS Needs Categories Definitions | A-1 |
| Table B-1. 2022 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)..... | B-1 |
| Table B-2. 2022 CWNS Reported Needs for Wastewater Subcategories by Category and State (January 2022 Dollars in Millions)..... | B-4 |
| Table B-3. 2022 CWNS Reported Needs for Stormwater Management by Category and State (January 2022 Dollars in Millions)..... | B-7 |
| Table B-4. 2022 CWNS Reported Needs for NPS Control by Category and State (January 2022 Dollars in Millions) | B-9 |
| Table C-1. 2008, 2012, and 2022 CWNS Reported Needs by State (January 2022 Dollars in Millions) | C-1 |
| Table D-1. 2012 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions) | D-1 |

List of Abbreviations

| | | | |
|------------------------|--|---------------|--|
| BMP | best management practice | MS4 | municipal separate storm sewer system |
| BOD₅ | 5-day biochemical oxygen demand | NEP | National Estuary Program |
| CET | cost estimation tool | NPS | nonpoint source |
| CIP | capital improvement plan | NR | not reported |
| CSO | combined sewer overflow | P.L. | Public Law |
| CWA | Clean Water Act | POTW | publicly owned treatment works |
| CWNS | Clean Watersheds Needs Survey | SSO | sanitary sewer overflow |
| CWSRF | Clean Water State Revolving Fund | U.S. | United States |
| DEP | data entry portal | U.S.C. | United States Code |
| EPA | U.S. Environmental Protection Agency | WRRDA | Water Resources Reform and Development Act |
| I/I | inflow and infiltration | | |
| IIJA | Infrastructure Investment and Jobs Act | | |

1. Introduction

The U.S. Environmental Protection Agency (EPA) has prepared this 2022 Clean Watersheds Needs Survey (CWNS) Report to Congress in compliance with Clean Water Act (CWA) section 516(b)(1)(B) as well as CWA section 609, which was added by the Infrastructure Investment and Jobs Act (IIJA), P.L. 117-58, November 15, 2021.¹ This Report summarizes the results of the EPA's 17th survey since the CWA was enacted in 1972.

As directed by Congress, the CWNS provides an assessment of the capital investments necessary for states, the District of Columbia, and U.S. territories (herein referred to as “states”) to meet the CWA water quality goals over the subsequent 20 years. These needs include projects and related infrastructure costs for wastewater publicly owned treatment works (POTWs), stormwater, nonpoint source (NPS) control, and decentralized wastewater treatment.² State participation is instrumental in surveys because the EPA relies on state programs to collect and submit data. In addition to needs data, respondents are encouraged to submit technical data for POTWs even if they do not have needs so the EPA can analyze national trends in wastewater treatment and improve future data collection. For the 2022 survey presented here, a detailed breakdown of the needs and technical data for wastewater treatment plants is available on the 2022 CWNS Data Dashboard.

Needs and Technical Data

For this Report:

- A “need” is defined as a currently unfunded project (or portion of a project) and the associated capital cost that addresses a water quality problem—or a public health problem related to water quality—existing as of January 1, 2022, or that is expected to occur within the next 20 years.³
- “Technical data” refers to data collected for each CWNS submission not related to infrastructure needs. Such data include wastewater or stormwater flow; population served; and descriptive data on discharge, effluent, unit processes, and utility management.

Access 2022 CWNS Data Online

An online companion to this Report is available at www.epa.gov/cwns. It contains the following:

- The 2022 CWNS Data Dashboard, which features interactive maps and charts of both needs data and wastewater technical data. The 2022 CWNS dataset can also be downloaded here, as a set of CSV files or Access database.
- A copy of this Report.
- A detailed explanation of the scope and methods used for this survey.
- The 2012, 2008, 2004, and 2000 CWNS reports and data.

¹ CWA section 516(b)(1)(B), 33 U.S.C. § 1375; CWA section 609, 33 U.S.C. § 1389.

² The Water Resources Reform and Development Act (P.L. 113-121, June 10, 2014) expanded Clean Water State Revolving Fund eligibilities by adding eight areas of eligibility, allowing states to fund a broader range of non-traditional projects nationwide. The IIJA (2021) amended the CWA by adding section 609, which directs the EPA to align the CWNS data collection with the Fund eligibilities, including the ones added in 2014.

³ Classification in this report as a “need” does not suggest a lack of funding from local, state, or federal sources (including collected rates, bonds, loans, or grants) for these projects, and should not be construed as a request for additional federal funding.

The nation's total reported needs for clean water infrastructure are \$630.1 billion.⁴ This is a 73 percent increase in total reported needs since the previous CWNS. Several factors contributed to the significant increase:

- The previous CWNS did not include the NPS Control and Decentralized Wastewater Treatment Systems categories. These categories were added to the survey scope as directed by Congress in the IIJA. If only the categories collected in both 2012 and 2022 are compared, the reported needs increased by 37 percent.
- Aging infrastructure and climate change pose ongoing challenges to clean water infrastructure nationwide.⁵
- More documentation was available online, and the 2022 data entry portal (DEP) supported more efficient and accurate reporting.
- To help states document their needs, the EPA updated existing wastewater infrastructure cost estimation tools (CETs) and developed new CETs for stormwater management and NPS control projects related to agriculture cropland and silviculture.

More information can be found in Section 5, “Changes Since 2012.”



Solar array providing power at the Town of Taos wastewater treatment plant. *Photo credit to New Mexico Environment Department.*

4 All needs amounts in this Report are shown in January 2022 dollars. Costs were adjusted from the documented cost year basis using the U.S. Bureau of Labor Statistics Consumer Price Index.

5 <https://www.epa.gov/arc-x/climate-adaptation-and-water-utility-operations>.

The overall needs presented in this Report are significant; however, the total likely underestimates the true nationwide need for a variety of reasons:

- This Report does not include Tribal wastewater needs, which are documented by a separate survey conducted by the Indian Health Service.⁶
- The CWNS encompasses a 20-year planning horizon, but most documentation submitted to the survey describes projects that will be completed in the near term (within 5–10 years). For example, 44 percent of 2022 CWNS needs were documented using municipal or utility capital improvement plans (CIPs) that typically only document projects included in shorter-term plans.
- Several challenges affected data collection and survey reporting. Many states reported difficulties in obtaining documentation with sufficient detail to substantiate project costs or had competing priorities and limited resources that affected their ability to collect the required data. States also encountered difficulty communicating with small communities and coordinating across a wide variety of agencies, public and private institutions, and local governments. Finally, resources allocated to data collection varied across states; some states had small data entry teams of one or more in-house staff while others had external resources at their disposal.

Despite these limitations, the 2022 CWNS represents the most comprehensive and robust report on clean water infrastructure needs in the United States. The CWNS is fundamental in helping the EPA and states assess potential gaps between the need for and the availability of funding for clean water infrastructure from all sources. No other national assessment exists on this scale. Unprecedented funding from the IJJA has given states the resources to help communities accelerate these needed investments, and the results of this Report show that substantial needs exist. Continuity and full participation in the survey is key to ensure that opportunities for investment are not being overlooked in historically underserved communities. The EPA remains committed to continually improving the CWNS and collaborating across the clean water sector to move toward a more sustainable future.

2. Scope and Methods

The CWNS is a voluntary, non-statistical sample survey, completed by the states in collaboration with the EPA. The survey described in this Report was designed to capture needs as of January 1, 2022, that are expected to occur within the next 20 years. Each state designates representatives, referred to as state coordinators, to complete the survey on the state's behalf. During the data entry period of March 1, 2022, to May 3, 2023, the EPA hosted and maintained an online DEP that allowed state coordinators to enter technical and needs data for more than 30,000 wastewater, stormwater, NPS control, and decentralized wastewater treatment submissions. Each submission represented some form of infrastructure. For example, a wastewater submission could represent a single collection system or a whole town's wastewater infrastructure, including the collection system, pump stations, and treatment plant.

⁶ The needs for capital investment in wastewater infrastructure on Tribal reservations and in Alaskan Native Villages are based on the Sanitation Deficiency System within the IHS Sanitation Tracking and Reporting System (<http://wstars.ihs.gov>).

Policies

Before the data entry period began, the EPA collaborated with three CWNS State Coordinating Committees to establish survey policies and improve on the data collection methodologies used during prior surveys. Based on committee input and review of past surveys, the EPA refined prior CWNS policies to improve clarity for the user, data quality, and survey response rates.

To be included in the survey, a project must be eligible to receive funding from the Clean Water State Revolving Fund (CWSRF) under section 1383(c) of the CWA, which defines projects and activities eligible for CWSRF assistance. The needs included in this Report were based on federal eligibilities, but some state programs have more restrictive requirements.

Examples of projects and costs that are not CWSRF-eligible are:

- Any project for a federally owned facility.
- Any project without a water quality benefit.
- Planning activities that are not reasonably expected to result in a capital project (e.g., water quality monitoring plan).
- Non-capital costs (e.g., operation and maintenance, municipality payroll).
- Land acquisition that is not part of an eligible project.

Finally, to be included in the survey, a project must have been unfunded as of January 1, 2022. For the CWNS, a project was considered funded if construction had started or external funds (e.g., a grant or loan) were committed to it. Projects included in this report may already be part of a municipality's plans, even if funding has not been committed and construction has not yet started. Inclusion in the CWNS does not necessarily mean that funding from local, state, or federal sources will not be available for the reported projects.

The following projects and costs were not included in the CWNS:

- Any costs for a CWSRF-eligible project starting before January 1, 2022, or that is planned for after December 31, 2041.
- Portions of costs based on escalation or inflation.
- Projects on Tribal lands and in Alaska Native Villages; these needs are reported separately by the Indian Health Service.

Needs in this Report are summarized using the categories defined in Appendix A.

Documentation

The CWNS policies require documentation to support the existence of needs. This can be done with any of the following:

- An approved planning document with the project description and cost.
- An approved state-specific approach.
- The EPA's CETs.
- A small community form.

Planning Documents

Most commonly, states documented needs with planning documents, such as a CIPs or long-term control plans. States could use documents designated by the EPA as pre-approved to support projects and costs, or they could request approval for documents not on the list.

State-Specific Approaches

As in past surveys, the EPA allowed states without planning documents to develop methodologies using state-specific data to document and assess needed projects and/or estimate costs. The EPA evaluated all approaches to ensure that the methods used were current and based on robust, relevant data; the EPA then approved each method for use before a state submitted the resulting project(s) and cost(s) through the DEP.

Cost Estimation Tools

As in past surveys, the EPA developed CETs to estimate costs for certain types of documented projects without cost estimates available in the supporting documentation. These DEP-based tools assign a dollar value for projects based on documented inputs provided by the state, such as the project location and design specifications. The CETs were developed using both external data sources (such as state loan data and proprietary models) and project data from past surveys. Each CET has maximum sizes or capacities based on the range of the data used to build the tool.

The EPA was unable to develop CETs for all project types due to lack of sufficient high-quality national datasets. In 2022, the EPA developed or updated CETs for:

- Secondary and advanced wastewater treatment (Categories I and II).
- Wastewater conveyance (Categories III and IV).
- Combined sewer overflow (CSO) correction (Category V).
- Stormwater management (Category VI).
- NPS control (Subcategories VII-A [Agriculture (Cropland)] and VII-C [Silviculture]).
- Decentralized wastewater treatment systems (Category XII).

Small Community Form

The EPA developed an online survey form for communities with populations of 10,000 or fewer. State coordinators could send this form via email to officials (e.g., mayor, public works manager, operator) to document needs when other documentation did not exist. The small community form provided two options for documenting project costs:

- Through the EPA's CETs, using inputs provided by the local staff.
- By the local staff entering their own cost estimates and having a state or local professional engineer certify the costs.

EPA Program Highlight

For more information on how the EPA supports small and rural communities, visit <https://www.epa.gov/small-and-rural-wastewater-systems>.

3. Data Quality Assurance

The EPA conducted quality assurance and quality control reviews of the data presented in this Report to ensure their precision and accuracy. Throughout these reviews, the EPA followed a quality assurance project plan, which it developed in keeping with its Information Quality Guidelines and the *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5, EPA/240/B-01/003).

The DEP allows states to directly enter needs and technical data and upload the required supporting documentation. The EPA developed the DEP to include automated checks of expected entries and value ranges to minimize incorrect or incompatible data entry. In addition, the EPA followed specific, documented protocols for reviewing technical and needs data submitted by states. These quality control checks were focused on technical data for wastewater submissions in addition to needs data for all infrastructure types. Data were reviewed throughout the data entry period as they were submitted and underwent additional checks at the close of data entry.



Pumps part of the aquifer storage and restoration project to remove excess nitrogen. *Photo credit to City of Hastings, NE.*

Technical Data Review

The EPA reviewed each wastewater submission to identify inconsistencies such as miscategorized infrastructure, unusual discharge locations, inconsistent effluent treatment levels, or incomplete sewersheds (e.g., a collection system not discharging to a treatment plant). At the end of data entry, the EPA summed the reported populations and compared them against the 2012 CWNS data and the 2020 Census data for each state to check for potential double-counting or misreporting. The EPA also checked for duplicate submissions and out-of-state locations for all infrastructure types (wastewater, stormwater, NPS control, and decentralized wastewater treatment) and worked with the states to correct any errors.

Needs Data Review

The EPA created a tiered review plan for the over 15,000 submissions with needs. Submissions received in-depth review if they either had high-value projects (i.e., projects totaling above \$40 million) or were supported by documentation that may not have included the required costs and detailed project descriptions. This included verifying that the cost reported by the state coordinators in the DEP matched the cost reported in the documentation, as well as confirming that the project type and needs category aligned. In situations where a project could be reasonably assigned to multiple categories, state coordinators chose either a single category or split the costs between categories. For all other submissions, the EPA performed quarterly audits of a random selection of approximately 5 percent of submissions from each state to confirm that costs were properly documented. The review results were used to make minor adjustments to a subset of the state’s overall needs.

4. Results: National Needs

The total nationwide reported clean water infrastructure needs identified as of January 1, 2022 were \$630.1 billion for the period between January 1, 2022, and December 31, 2041 (shown by category in Table 1 and Figure 1). About 55 percent of these needs were for wastewater infrastructure—treatment plant improvements, conveyance system repairs, new conveyance systems, CSO correction, recycled water distribution, and desalination. Stormwater infrastructure had the next highest needs, at 18 percent of the overall total. Classification in this report as a “need” does not suggest a lack of funding from local, state, or federal sources (including collected rates, bonds, loans, or grants) for these projects, and should not be construed as a request for additional federal funding.

Figure 2 displays the geographic distribution of the total reported needs by state. New York and California each had needs exceeding \$50 billion, and Florida, Virginia, Louisiana, and Georgia each had needs exceeding \$25 billion. Together, these six states reported 42 percent of the total nationwide needs. Twenty-eight states each reported less than one percent of the total needs. Appendix B presents the total reported needs for all categories by state.

Figure 3 displays reported needs per capita by state. Northern Mariana Islands (\$7,203), West Virginia (\$6,182), New Mexico (\$5,799), Louisiana (\$5,776), and Virginia (\$5,303) reported the highest needs per capita.

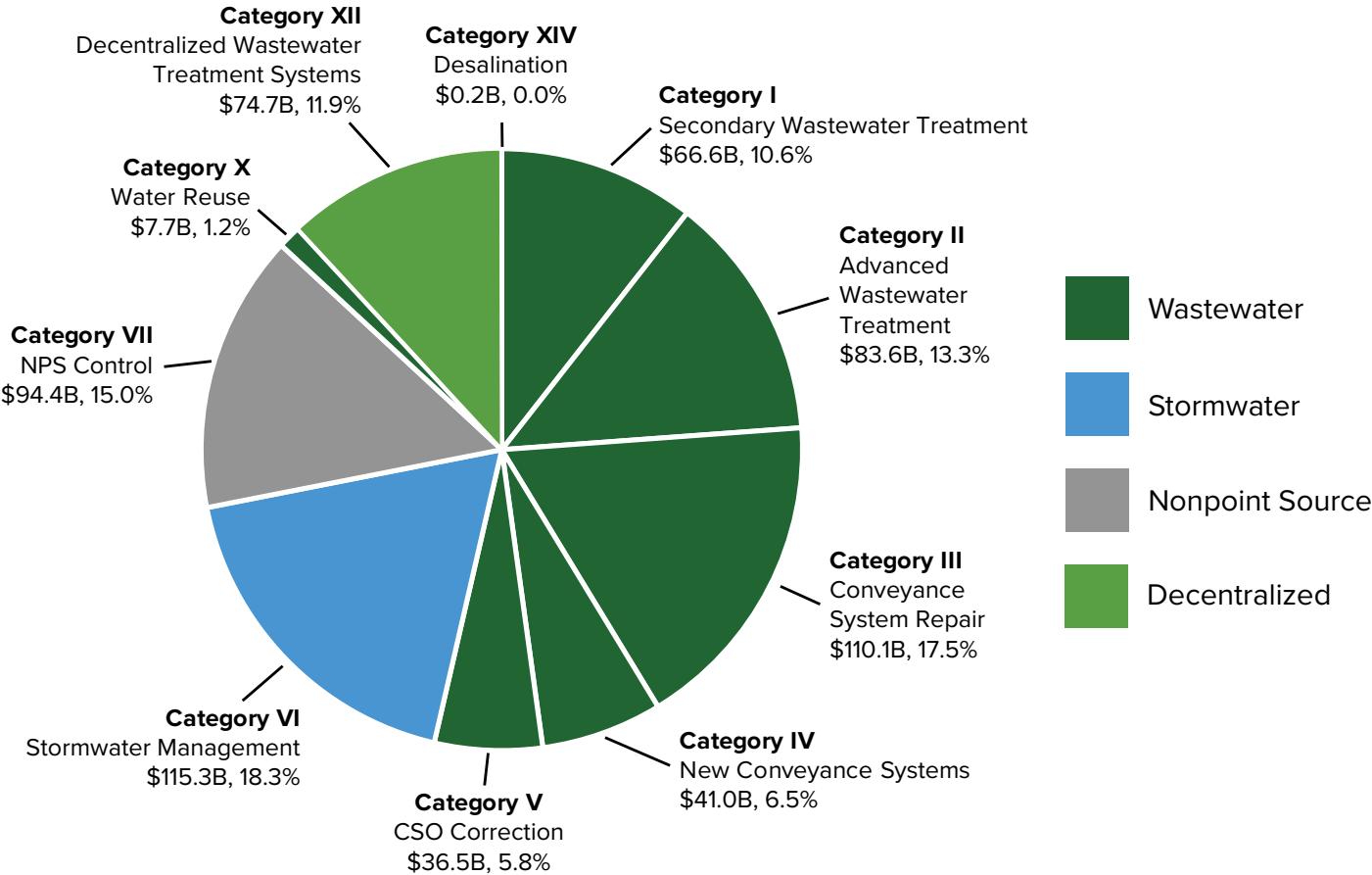


Figure 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)

Table 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)

| Category Number | Category Name | National Needs | |
|-----------------|--|----------------|-------------------|
| | | \$Billion | Percent |
| I | Secondary Wastewater Treatment | \$66.6 | 10.6% |
| II | Advanced Wastewater Treatment | \$83.6 | 13.3% |
| III | Conveyance System Repair | \$110.1 | 17.5% |
| IV | New Conveyance Systems | \$41.0 | 6.5% |
| V | CSO Correction | \$36.5 | 5.8% |
| VI | Stormwater Management | \$115.3 | 18.3% |
| VII | NPS Control | \$94.4 | 15.0% |
| X | Water Reuse | \$7.7 | 1.2% |
| XII | Decentralized Wastewater Treatment Systems | \$74.7 | 11.9% |
| XIV | Desalination | \$0.2 | 0.0% ^a |
| Total | | \$630.1 | 100.0% |

^a Estimate is less than 0.1 percent.



Storm grate with leaves. Photo Credit: Flickr.

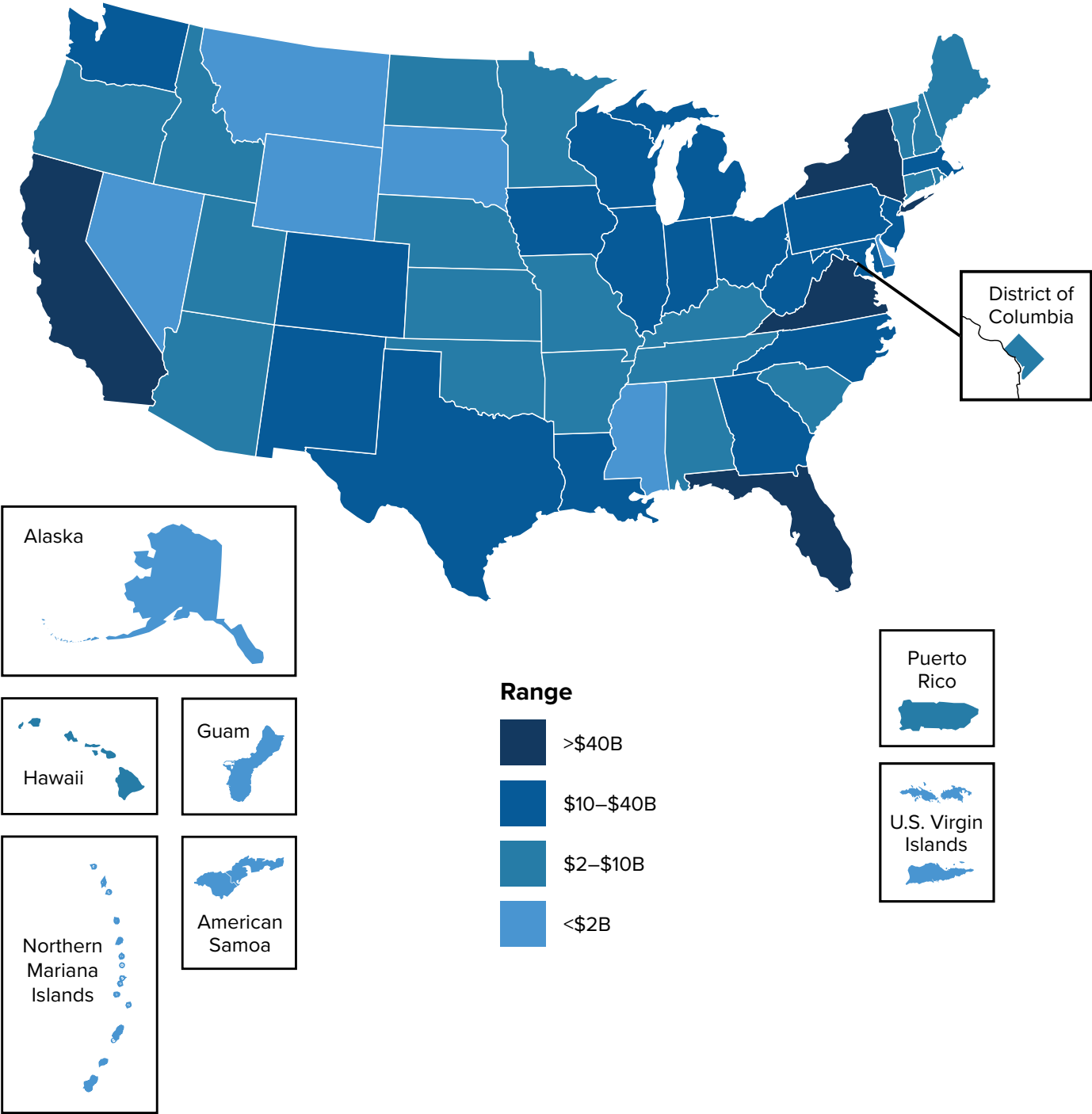


Figure 2. Distribution of Total Reported Needs by State (January 2022 Dollars in Billions)

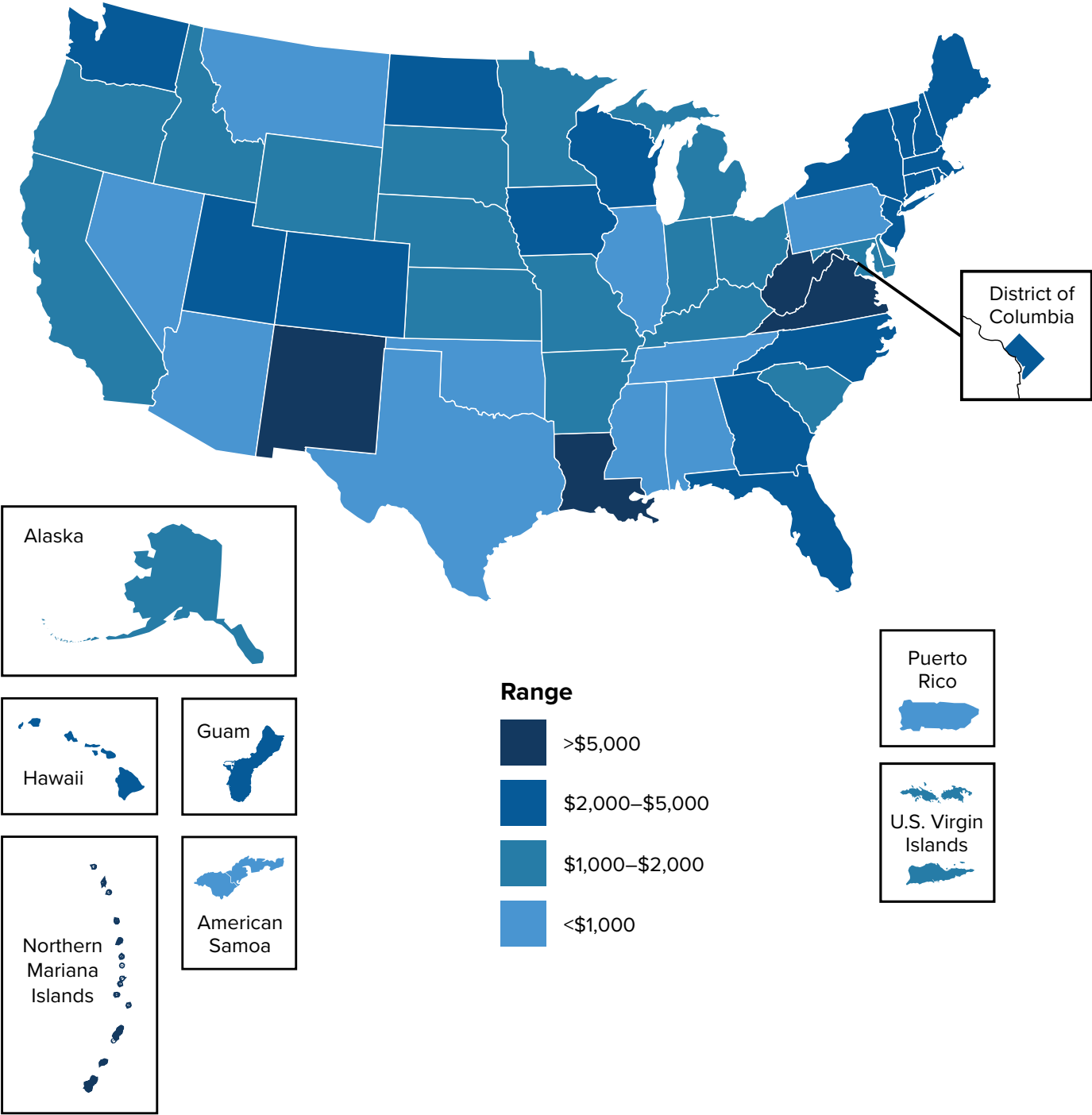


Figure 3. Distribution of Per Capita Reported Needs by State (January 2022 Dollars/Person)

Table 2: Total and Per Capita Reported Needs by State

| State | Total Reported Needs (January 2022 Dollars Rounded to the Nearest Million) | Per Capita Reported Needs (January 2022 Dollars per Person) |
|----------------------|--|--|
| Alabama | \$4,026,000,000 | \$801 |
| Alaska | \$775,000,000 | \$1,057 |
| American Samoa | \$30,000,000 | \$604 |
| Arizona | \$4,784,000,000 | \$669 |
| Arkansas | \$5,453,000,000 | \$1,811 |
| California | \$65,533,000,000 | \$1,657 |
| Colorado | \$19,170,000,000 | \$3,320 |
| Connecticut | \$9,825,000,000 | \$2,725 |
| Delaware | \$1,265,000,000 | \$1,278 |
| District of Columbia | \$2,220,000,000 | \$3,220 |
| Florida | \$46,559,000,000 | \$2,162 |
| Georgia | \$25,569,000,000 | \$2,387 |
| Guam | \$479,000,000 | \$3,113 |
| Hawaii | \$3,336,000,000 | \$2,292 |
| Idaho | \$2,586,000,000 | \$1,406 |
| Illinois | \$11,375,000,000 | \$888 |
| Indiana | \$10,132,000,000 | \$1,493 |
| Iowa | \$12,299,000,000 | \$3,855 |
| Kansas | \$4,239,000,000 | \$1,443 |
| Kentucky | \$7,483,000,000 | \$1,661 |
| Louisiana | \$26,904,000,000 | \$5,776 |
| Maine | \$3,995,000,000 | \$2,932 |
| Maryland | \$10,657,000,000 | \$1,725 |
| Massachusetts | \$21,710,000,000 | \$3,088 |
| Michigan | \$15,072,000,000 | \$1,496 |
| Minnesota | \$6,716,000,000 | \$1,177 |
| Mississippi | \$1,933,000,000 | \$653 |
| Missouri | \$9,102,000,000 | \$1,479 |
| Montana | \$347,000,000 | \$320 |
| Nebraska | \$3,171,000,000 | \$1,617 |
| Nevada | \$531,000,000 | \$171 |

| State | Total Reported Needs (January 2022 Dollars Rounded to the Nearest Million) | Per Capita Reported Needs (January 2022 Dollars per Person) |
|--------------------|--|--|
| New Hampshire | \$4,287,000,000 | \$3,112 |
| New Jersey | \$19,352,000,000 | \$2,083 |
| New Mexico | \$12,280,000,000 | \$5,799 |
| New York | \$53,917,000,000 | \$2,669 |
| North Carolina | \$21,136,000,000 | \$2,025 |
| North Dakota | \$2,621,000,000 | \$3,364 |
| N. Mariana Islands | \$341,000,000 | \$7,203 |
| Ohio | \$20,555,000,000 | \$1,742 |
| Oklahoma | \$3,436,000,000 | \$868 |
| Oregon | \$5,541,000,000 | \$1,308 |
| Pennsylvania | \$12,765,000,000 | \$982 |
| Puerto Rico | \$2,711,000,000 | \$825 |
| Rhode Island | \$2,485,000,000 | \$2,264 |
| South Carolina | \$7,351,000,000 | \$1,436 |
| South Dakota | \$1,116,000,000 | \$1,258 |
| Tennessee | \$3,852,000,000 | \$557 |
| Texas | \$18,857,000,000 | \$647 |
| Utah | \$9,728,000,000 | \$2,973 |
| Vermont | \$2,104,000,000 | \$3,272 |
| Virgin Islands | \$157,000,000 | \$1,800 |
| Virginia | \$45,770,000,000 | \$5,303 |
| Washington | \$18,627,000,000 | \$2,417 |
| West Virginia | \$11,089,000,000 | \$6,182 |
| Wisconsin | \$12,013,000,000 | \$2,038 |
| Wyoming | \$699,000,000 | \$1,213 |

5. Changes Since 2012

Between the 2012 and 2022 surveys, reported needs rose significantly from \$336.0 billion⁷ to \$630.1 billion. Many factors contributed to this large change. Two infrastructure categories were added in the 2022 total needs, the number of planned water quality projects addressing aging infrastructure and climate change adaptation increased, and an improved online portal simplified data collection and led to robust participation—all states participated in the 2022 CWNS.⁸ Additionally, costs based on escalation or inflation are not permitted in the survey, which may lead to an underestimate of future project costs. A comparison of needs reported in the last three surveys can be found in Appendix C.

Several legislative changes have affected the CWSRF program since the 2012 Report. The Water Resources Reform and Development Act (WRRDA, P.L. 113-121, June 10, 2014) expanded CWSRF eligibilities by adding eight areas of eligibility, allowing states to fund a broader range of non-traditional projects nationwide. The IIJA (P.L. 117-58, November 15, 2021) amended the CWA by adding section 609, which directs the EPA to align the CWNS data collection with the CWSRF eligibilities, including the expanded eligibilities added in 2014. Due to these changes, this Report includes reported needs in two categories that were not included in the 2012 total: \$94.4 billion in NPS Control (Category VII) and \$74.7 billion in Decentralized Wastewater Treatment Systems (Category XII).

Some modifications for the 2022 CWNS that did not affect the total reported needs include adjustments to the needs categories. The EPA condensed Stormwater Management (Category VI) from four subcategories in 2012 into three subcategories in 2022 (gray, green, and general stormwater management), renamed Recycled Water Distribution (Category X) to Water Reuse, and added Desalination (Category XIV) as its own category. Categories VIII (Confined Animal [Point Source]), IX (Mining [Point Source]), XI (Estuary Management), and XIII (Planning) have been excluded from data collection since 2004.

The three categories with the largest changes in reported needs from 2012 to 2022 are as follows:

- **Stormwater Management (Category VI)** increased by \$91.5 billion, a 385 percent increase from 2012. Legislative changes since 2012 have increased the types of stormwater projects eligible for CWSRF funding. In addition, stormwater management requirements have expanded in many urban areas since 2012, which has likely triggered construction and planning for new stormwater facilities.⁹ Heavy precipitation events can overwhelm previously adequate storm sewer infrastructure and, according to the Fifth National Climate Assessment,¹⁰ the frequency and intensity of these events is projected to increase over the 21st century. Additional impervious cover leads to increased runoff from storm events and necessitates expansion of existing systems to protect human health and water quality.¹¹

Reported Dollars

All needs amounts in this Report are shown in January 2022 dollars. Costs were adjusted using the U.S. Bureau of Labor Statistics Consumer Price Index.

7 2012 reported needs totaled \$336.0 billion in January 2022 dollars, converted from \$271 billion in January 2012 dollars. Appendix D presents the total 2012 reported needs for all categories by state in January 2022 dollars.

8 The 2012 CWNS did not include needs from South Carolina, American Samoa, and the Northern Mariana Islands.

9 <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources-resources>.

10 <https://doi.org/10.7930/NCA5.2023.CH1>.

11 <https://www.epa.gov/sourcewaterprotection/urbanization-and-stormwater-runoff>.

- **Advanced Wastewater Treatment (Category II)** increased by \$22.1 billion, a 36 percent increase from 2012. States have implemented more stringent discharge treatment standards to improve water quality in receiving waters. For example, many states have adopted standards for nitrogen and phosphorus since 2012 that secondary treatment processes would not meet.¹²
- **CSO Correction (Category V)** decreased by \$23.0 billion, a 39 percent decrease from 2012. Many combined sewer communities have made extensive investments in the last ten years to reduce their CSO discharges.¹³ Strategies such as integrated planning and smart sewer technology have also helped communities more cost-efficiently manage, reduce, or eliminate their CSOs.

EPA Program Highlight

For more information on the EPA's CSO program, visit <https://www.epa.gov/npdes/combined-sewer-overflows-csos>.

Table 3 and Figure 4 present a comparison of needs by category for the 2008, 2012, and 2022 surveys in billions of dollars (adjusted to January 2022 dollars). Note that there is no comparison for Desalination (Category XIV) needs, as they were not reported in a separate category in previous surveys.

Table 3. 2008–2022 CWNS Total Needs by Survey Year (January 2022 Dollars in Billions)

| Category Number | Category Name | Survey Year | | | Change 2012 to 2022 | |
|-----------------|---|----------------------------|----------------------------|----------------|---------------------|----------------|
| | | 2008 | 2012 | 2022 | \$Billion | Percent Change |
| I | Secondary Wastewater Treatment | \$79.7 | \$64.9 | \$66.6 | \$1.7 | 3% |
| II | Advanced Wastewater Treatment | \$60.3 | \$61.5 | \$83.6 | \$22.1 | 36% |
| III–IV | Conveyance System Repair and New Conveyance Systems | \$109.9 | \$118.7 | \$151.1 | \$32.4 | 27% |
| V | CSO Correction | \$84.5 | \$59.5 | \$36.5 | -\$23.0 | -39% |
| VI | Stormwater Management | \$56.2 | \$23.8 | \$115.3 | \$91.5 | 385% |
| VII | NPS Control | \$30.3 | NR | \$94.4 | \$94.4 | NA |
| X | Water Reuse | \$5.9 | \$7.5 | \$7.7 | \$0.2 | 3% |
| XII | Decentralized Wastewater Treatment Systems | \$31.8 | \$27.4 | \$74.7 | \$47.3 | 172% |
| XIV | Desalination | NR | NR | \$0.2 | \$0.2 | NA |
| Total | Total Needs for Categories I to XIV | \$458.6^a | \$363.4^a | \$630.1 | \$266.7 | 73% |
| I–II | Wastewater Treatment Subtotal | \$139.9 | \$126.4 | \$150.2 | \$23.8 | 19% |
| I–V | Wastewater Subtotal | \$334.5 | \$304.7 | \$337.8 | \$33.1 | 11% |

NA = not applicable; NR = not reported.

^a Includes NPS Control (Category VII) and/or Decentralized Wastewater Treatment Systems (Category XII) needs that were not included in the total needs since they were not specifically identified in CWA section 516(b)(1)(B). Since 2012, both the CWSRF eligibilities and CWNS data collection requirements have been amended in the CWA.

¹² <https://www.epa.gov/system/files/documents/2022-04/compendium-of-npdes-nutrient-permitting-approaches.pdf>.

¹³ <https://www.epa.gov/npdes/combined-sewer-overflow-program-progress>.

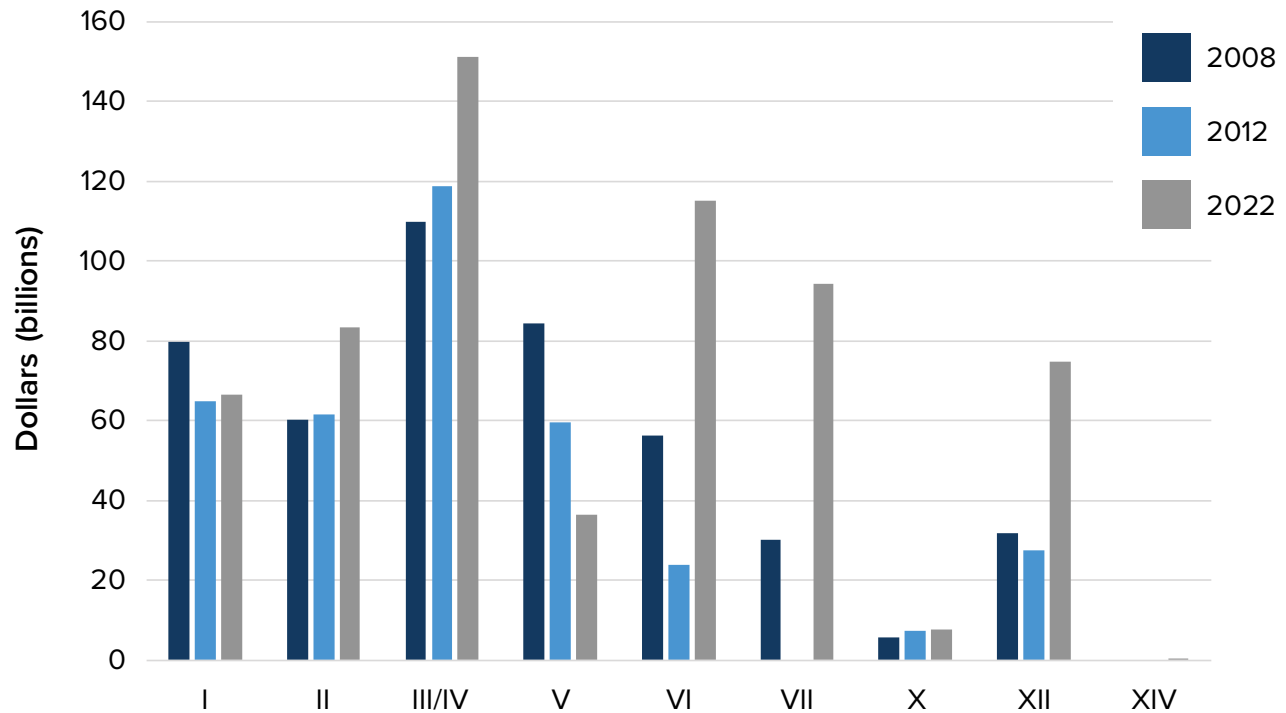


Figure 4. Total Reported Needs Nationwide for the 2008–2022 CWNS by Category (January 2022 Dollars in Billions)

6. 2022 Needs by CWNS Category

The following subsections present summaries and trends for each category in the 2022 survey. Appendix A contains detailed definitions of the categories.

Secondary Wastewater Treatment (Category I)

Highlights

- Category definition: The capital costs for wastewater treatment plants to meet secondary treatment standards.
- Total needs: \$66.6 billion.
- Change in total needs from 2012: Increase of 3 percent (\$1.7 billion).
- Number of states reporting needs: 54.
- States with the highest reported needs: New York (\$16.0 billion), California (\$7.0 billion), New Jersey (\$4.6 billion), Washington (\$4.3 billion), and Texas (\$4.0 billion).
- States with the largest per capita needs: Northern Mariana Islands (\$2,010), Guam (\$1,863), New York (\$794), Hawaii (\$693), and Kentucky (\$643).

Discussion

This category encompasses three types of need (with reporting varying by state): needs for treatment plants that meet secondary standards, some needs for primary and secondary unit processes at advanced treatment plants, and needs for treatment plants that provide less-than-secondary-treated effluent (although this is relatively rare in the United States, as discussed later in this Report). Category I needs increased by 3 percent compared to 2012 needs. As discussed in the Advanced Wastewater Treatment section, the more substantial increase for wastewater treatment needs was associated with advanced treatment.

The vast majority of the costs were documented with planning documents, with less than one percent (\$583 million) estimated using the EPA's CETs. Sixty-four percent of the needs under this category (\$42 billion) were supported by CIPs.



Interior of the biosolids reuse processing facility at the Village Creek Water Reclamation Plant in Fort Worth, TX. *Photo Credit: Texas Water Development Board.*

Advanced Wastewater Treatment (Category II)

Highlights

- Category definition: The capital costs for wastewater treatment plants to attain or maintain a level of treatment that is more stringent than secondary treatment.
- Total needs: \$83.6 billion.
- Change in total needs from 2012: Increase of 36 percent (\$22.1 billion).
- Number of states reporting needs: 50.
- States with the highest reported needs: Florida (\$13.9 billion), California (\$10.8 billion), Georgia (\$7.1 billion), Colorado (\$5.6 billion), and North Carolina (\$4.1 billion).
- States with the largest per capita needs: Utah (\$1,070), Colorado (\$976), Iowa (\$973), Georgia (\$661), and Florida (\$644).

Discussion

Needs for Category II increased by 36 percent compared to 2012 needs. As discussed in the Secondary Wastewater Treatment section, some states reported all needs for a treatment plant providing advanced treatment under this category, while other states reported only the needs for the unit processes contributing to advanced treatment.

Fifty out of 56 states reported needs in this category; states that did not report Category II needs were Alaska, American Samoa, Guam, Northern Mariana Islands, Virgin Islands, and Wyoming. Although Alaska and Wyoming did report having treatment plants with advanced effluent, there were no reported Category II needs for these plants. Advanced treatment needs continued to be highest in Florida, California, and North Carolina, with Georgia and Colorado also in the top five states reporting needs.

Advanced treatment needs constituted a higher percentage of wastewater treatment plant needs in 2022 (56 percent) as compared to 2012 (49 percent). Sixty-two percent of the needs under this category (\$51.6 million) were supported by CIPs. Three percent (\$2.9 billion) were estimated using the EPA's CETs.

Of the 17,544 treatment plants reported as existing in 2022, 6,705 currently provide advanced treatment. By the end of the survey period, 7,576 of the 17,679 total treatment plants are expected to provide advanced treatment. Of those, 161 were reported as newly planned treatment facilities to be constructed within the survey period.

Needs of Note

The Milwaukee (Wisconsin) Metropolitan Sewerage District reported Category II needs to increase the capacity of the District's Jones Island Water Reclamation Facility to use landfill gas, a natural byproduct of decomposition in the city's Metro Landfill, in place of natural gas. The landfill gas will be used as a source of energy to help power the treatment plant and will also be used to produce biosolids-based commercial fertilizer that is sold across the country. This Category II project will build infrastructure to treat gas from the landfill and deliver it to the district's landfill gas pipeline.

Conveyance System Repair (Category III) and New Conveyance Systems (Category IV)

Highlights

- Category definitions: The capital costs to rehabilitate and replace existing conveyance systems and install new ones.
- Total needs: \$151.1 billion.
- Change in total needs from 2012: Increase of 27 percent (\$32.4 billion).
- Number of states reporting needs: 55.
- States with the highest reported needs: New York (\$18.9 billion), California (\$15.0 billion), Florida (\$10.6 billion), Ohio (\$9.8 billion), and North Carolina (\$7.3 billion).
- States with the largest per capita needs: Northern Mariana Islands (\$5,147), District of Columbia (\$1,932), Virgin Islands (\$1,681), Hawaii (\$1,448), and West Virginia (\$1,266).



Construction on the Christina River Force Main that conveys wastewater to the Wilmington Water Pollution Control Facility in DE. Photo credit to Delaware Department of Natural Resources and Environment Control.

Discussion

Needs for the nation's wastewater conveyance systems continued to increase. Categories III and IV include the costs to: correct inflow and infiltration (I/I) problems; rehabilitate and replace structurally deteriorating sanitary or combined sewers for existing pipe; and construct new collector and interceptor sewers, pump stations, and appurtenances. The 27 percent increase from \$118.7 billion in 2012 to \$151.1 billion in 2022 is likely due to a combination of factors, including the aging of the nation's conveyance systems, system expansion to accommodate population growth, and installation of new conveyance systems in areas served by failing decentralized wastewater treatment systems.

All states except for American Samoa reported needs in Categories III and/or IV. Reported needs continued to be highest in New York, California, Florida, and Ohio, with North Carolina moving into the top five states reporting needs. Sixty-six percent of the needs under this category (\$99.8 billion) were documented in CIPs.

Sanitary Sewer Overflow Correction

Sanitary sewer overflows (SSOs) are untreated or partially treated releases of sewage from sanitary sewer systems before it reaches the POTW treatment plant. Of the \$26.6 billion reported needs to eliminate SSOs (8 percent of the total wastewater need), the majority (81 percent) was reported under Categories III and IV for corrections to collection systems (e.g., eliminating basement backups, repairing collection systems, adding system capacity). The remaining \$5.2 billion was for wastewater treatment, such as treatment plant expansion, including \$2.5 billion for needs in the Secondary Wastewater Treatment category (Category I) and \$2.6 billion for needs in the Advanced Wastewater Treatment category (Category II).¹⁴

Combined Sewer Overflow Correction (Category V)

Highlights

- Category definition: The capital costs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater that occur when the capacity of a sewer system is exceeded during a wet weather event.
- Total needs: \$36.5 billion.
- Change in total needs from 2012: Decrease of 39 percent (\$23.0 billion).
- Number of states reporting needs: 35.
- States with the highest reported needs: New York (\$6.0 billion), Pennsylvania (\$4.4 billion), New Jersey (\$3.6 billion), Connecticut (\$2.9 billion), and Indiana (\$2.9 billion).
- States with the largest per capita needs: West Virginia (\$922), Connecticut (\$817), District of Columbia (\$575), Rhode Island (\$534), and Indiana (\$431).

¹⁴ State coordinators designated which needs in Categories I–IV were for SSO correction at the needs category level, not at the project level. Therefore, some projects may not be included, if only a portion of the category needs were for correcting an SSO.

Discussion

Category V needs continued to decline, with a 39 percent (\$23.0 billion) decline since 2012, following the 33 percent decline from 2008 to 2012.¹⁵ Changes in CSO control best practices have likely contributed to this continuing trend. Strategies such as integrated planning and smart sewer technology have helped communities more cost-efficiently manage, reduce, or eliminate their CSOs. The majority (55 percent or \$20.1 billion) of needs under this category were supported by CIPs, which typically have a five-year planning horizon. These short-term planning documents likely do not represent the full 20-year needs as compared to longer-term planning documents, such as long-term control plans. These longer-term planning documents only supported 13 percent (\$4.9 billion) of Category V needs in 2022 but were used to document a higher percentage of needs in previous surveys; this shift in use of longer-term plans may have also contributed to the decline. Reported needs continued to be highest in New Jersey, New York, and Indiana, with Pennsylvania and Connecticut moving into the top five states reporting needs.

EPA Program Highlight

For more information on integrated planning, visit <https://www.epa.gov/npdes/integrated-planning-municipal-stormwater-and-wastewater>.

EPA Program Highlight

The EPA's Sewer Overflow and Stormwater Reuse Municipal Grant Program, also referred to as the Overflow Stormwater Grant Program, awards grants to the states to provide sub-awards to eligible municipalities or municipal entities for the planning, design, and construction of eligible projects to address infrastructure needs for CSOs, SSOs, and stormwater management. For more information, visit <https://www.epa.gov/cwsrf/sewer-overflow-and-stormwater-reuse-municipal-grants-program>.

Stormwater Management (Category VI)

Highlights

- Category definition: The capital costs to plan and implement structural and nonstructural measures to control the runoff water resulting from precipitation (stormwater) in National Pollutant Discharge Elimination System Phase I, Phase II, and nontraditional municipal separate storm sewer systems (MS4s), as well as unregulated communities.
- Total needs: \$115.3 billion.
- Change in total needs from 2012: Increase of 385 percent (\$91.5 billion).
- Number of states reporting needs: 51.
- States with the highest reported needs: Virginia (\$30.2 billion), California (\$16.2 billion), Florida (\$12.0 billion), Massachusetts (\$7.7 billion), and Michigan (\$6.0 billion).
- States with the largest per capita needs: Virginia (\$3,495), Massachusetts (\$1,096), Vermont (\$982), New Mexico (\$877), and Colorado (\$764).

¹⁵ Due to inconsistencies in how states categorize gray versus green CSO infrastructure projects, these projects' needs were entered together under a single category in 2022 (in 2012, the needs were entered in separate subcategories).

Discussion

Category VI needs increased by 385 percent (\$91.5 billion) due to many factors. Most importantly, WRRDA expanded CWSRF eligibilities for stormwater projects under CWA section 603(c). This broadened the types of stormwater projects eligible for inclusion in this survey compared to 2012. As discussed in section 5, other factors include changing stormwater management requirements, an increase in the frequency and intensity of heavy precipitation events due to climate change, and an increase in impervious surfaces; all of these have contributed to the significant increase in reported needs. State participation also increased from 35 states in 2012 to 51 states in 2022.

EPA Program Highlight

The EPA estimates there are 855 Phase I MS4s and 6,695 Phase II MS4s nationwide; however, 1,327 Phase I MS4s and 5,528 Phase II MS4s reported needs in the survey.¹⁶ For more information, visit <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources>.

As shown in Figure 5, the growth in green infrastructure needs was a substantial portion of this category’s increase since 2012. Needs continued to be high in California, with Virginia, Florida, Massachusetts, and Michigan moving into the top five states reporting needs.

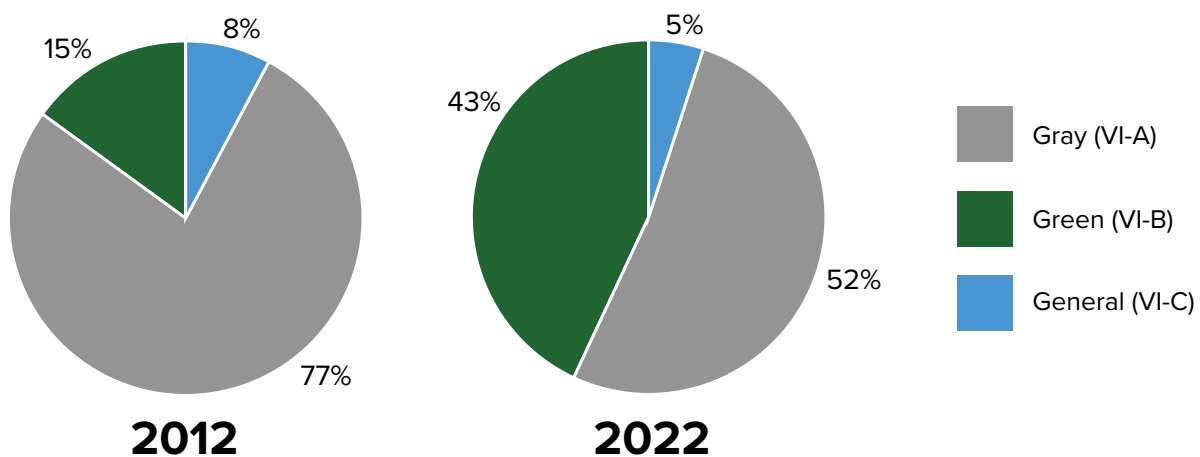


Figure 5. Percent of Stormwater Needs by Subcategory in 2012 and 2022

Forty percent of the needs under this category (\$45.8 billion) were supported by CIPs, and 29 percent (\$33.0 billion) were supported by watershed-based plans. The majority of the \$33.0 billion was for nutrient reductions in the Chesapeake Bay watershed, with \$30.2 billion reported in Virginia and \$1.7 billion in Pennsylvania.

Needs of Note

Virginia applied the Chesapeake Assessment Scenario Tool (CAST) to estimate needed stormwater best management practices (BMPs) and associated costs to reach the objectives of Virginia’s Total Maximum Daily Load (TMDL) Phase III Watershed Implementation Plan.

¹⁶ The CWNS review process did not include verifying the existence of MS4s.

Nonpoint Source Control (Category VII)

Highlights

- Category definition: The capital costs to manage and/or treat NPS pollution, which is any source of water pollution that does not meet the legal definition of “point source,” per CWA section 502(14). NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.
- Total needs: \$94.4 billion.
- Change in total needs from 2012: Not reported in 2012.
- Number of states reporting needs: 50.
- States with the highest reported needs: Louisiana (\$22.0 billion), California (\$9.2 billion), New Mexico (\$7.1 billion), Colorado (\$4.9 billion), and West Virginia (\$4.8 billion).

Discussion

Category VII needs constituted 15 percent of the 2022 needs. While Category VII was not included in the 2012 Report, it was reported in prior surveys and has been historically underrepresented. To more fully account for these needs in the 2022 CWNS, the EPA investigated methods for improving state reporting and developed CETs for two of the Category VII subcategories (VII-A Agriculture [Cropland] and VII-C Silviculture), which had near national coverage. The EPA investigated creating additional NPS CETs but could not implement them due to the site-specificity of many NPS practices and the lack of current, national-level datasets. Table 4 presents the needs and the number of states reporting needs by subcategory.

The five states with the highest needs in this category (see above) account for over 50 percent of the reported NPS needs. Louisiana alone documented \$22.0 billion of the Category VII needs using its *Comprehensive Master Plan for a Sustainable Coast*, which outlines a plan to respond to the loss of coastal land due to climate change and human impacts. Documentation for the remaining needs included \$24.1 billion estimated using the CETs and \$31.0 billion reported through state-specific approaches.

The \$94.4 billion in Category VII needs encompasses more larger-scale and longer-term needs than wastewater and stormwater categories. Needs were primarily documented by state-specific approaches and statewide CETs that cover a large geographic area. These documents also included longer-term planning needs compared to what is typically included in municipal or utility budget documents (e.g., five-year CIPs). Although the EPA’s CETs estimated five-year needs for consistency with other planning documentation, state-specific approaches and other documentation used to support these needs may align better with the 20-year survey period.

Needs of Note

Michigan reported needs in Category VII-G (Resource Extraction) to address the buildup of “stamp sands” in Lake Superior and restore water quality in the lake’s Buffalo Reef, a critical trout and whitefish spawning habitat. The stamp sands are 23 million tons of copper mining tailings that were dumped in the watershed about a century ago and moved by lake currents to the Buffalo Reef area. The project would remove these deposits and place them in a newly built landfill near the lake.

Table 4. NPS Control Needs by Subcategory

| Subcategory Number | Category Name | 2022 Needs (\$Billion) | Number of States Reporting Needs |
|--------------------|---|------------------------|----------------------------------|
| VII-A | Agriculture (Cropland) | \$27.6 | 43 |
| VII-B | Agriculture (Animals) | \$2.0 | 21 |
| VII-C | Silviculture | \$15.8 | 29 |
| VII-E | Groundwater Protection (Unknown Source) | \$0.5 | 10 |
| VII-F | Marinas | <\$0.05 | 4 |
| VII-G | Resource Extraction | \$3.1 | 7 |
| VII-H | Brownfields/Superfund | \$0.8 | 8 |
| VII-I | Storage Tanks | \$0.3 | 6 |
| VII-J | Sanitary Landfills | \$0.8 | 17 |
| VII-K ^a | Hydromodification | \$33.5 | 35 |
| VII-M | Other Estuary Management Activities | \$9.9 | 10 |

^a Due to the broad nature of Subcategory VII-K, needs included projects to address conventional hydromodification (altering the hydrological characteristics of coastal and non-coastal waters) as well as other NPS Control projects whose tie to hydromodification was not clear but that were related to wetland or riparian area protection or restoration.

Identifying projects and assessing the cost to implement them continues to be a challenge across all NPS Control subcategories. Some state coordinators decided to focus their limited resources on gathering needs for wastewater and stormwater infrastructure because acceptable cost documentation was harder to obtain for Category VII projects. Additionally, not all state CWSRF programs fund NPS control projects, so some states may not have this information readily available.



Riparian restoration project to return Squalicum Creek to its natural conditions in WA. *Photo credit: Washington Department of Ecology.*

Water Reuse (Category X)

Highlights

- Category definition: The capital costs associated with conveyance of treated wastewater that is being reused, including associated rehabilitation/replacement needs.
- Total needs: \$7.7 billion.
- Change in total needs from 2012: Increase of 3 percent (\$0.2 billion).
- Number of states reporting needs: 31.
- States with the highest reported needs: California (\$3.8 billion), Florida (\$951 million), Virginia (\$710 million), Texas (\$659 million), and New Mexico (\$340 million).

Discussion

Water Reuse (previously named “Recycled Water Distribution”) needs increased slightly (3 percent) between 2012 and 2022, with the number of states reporting needs increasing from 25 to 31. Reported needs continued to be highest in California and Florida, with Virginia, Texas, and New Mexico moving into the top five states reporting needs. Note that this category only captures needs associated with conveying treated wastewater intended for reuse. The needs associated with improving effluent water quality to a level sufficient for reuse are reported under Category II.

Figure 6 shows the reuse discharge types that states reported for treatment plants in 2022 and expected in 2042. The most prevalent reuse discharge types reported are irrigation (landscape- and agriculture-related) and environmental restoration/groundwater discharge. Other reuse discharge types such as impoundments, industrial, potable, and other centralized non-potable reuse were reported less often but are expected to grow over the next 20 years.

Needs of Note

The Sacramento Regional County Sanitation District in California reported \$441.4 million in needs to develop infrastructure to deliver recycled water to agricultural lands as part of the district’s Harvest Water program. The program, which aims to irrigate over 16,000 acres, would sustain prime agricultural areas while promoting groundwater recharge. The hydrologic restoration would provide habitat for threatened species and support a longer salmon migration window, among other ecological benefits.

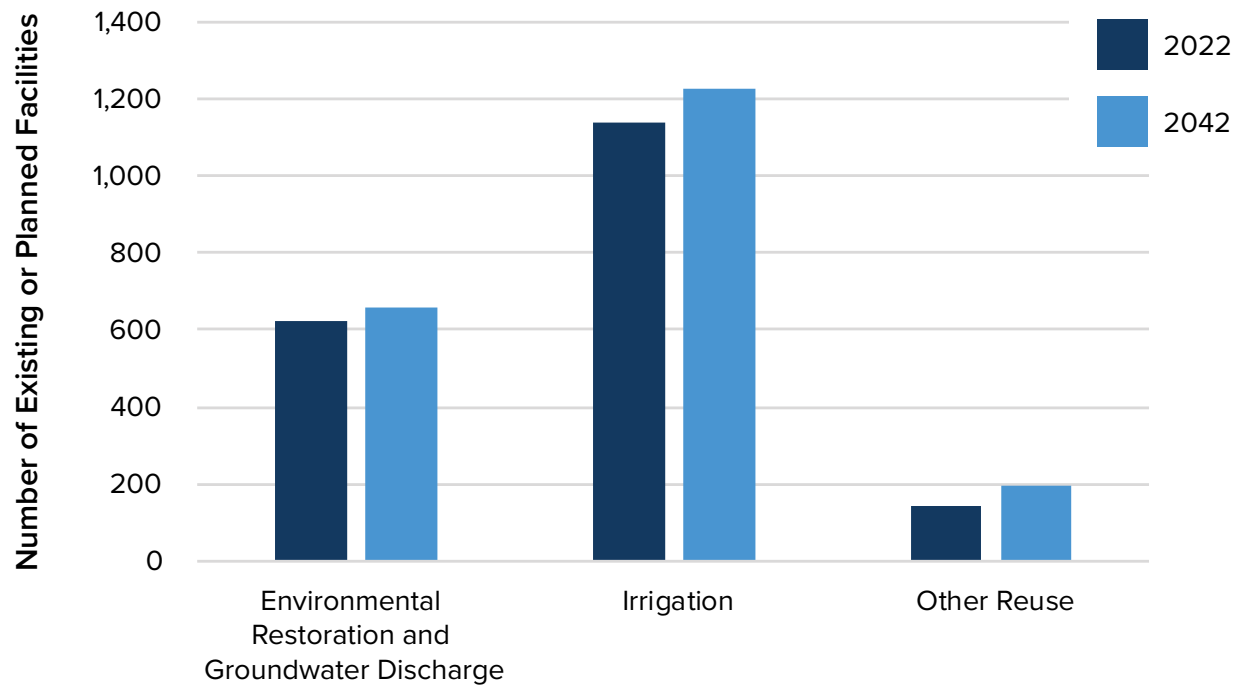


Figure 6. Number of Reported Reuse Discharge Types in 2022 and 2042¹⁷

Decentralized Wastewater Treatment Systems (Category XII)

Highlights

- Category definition: The capital costs associated with the rehabilitation, replacement, or new installation of on-site (individual) or clustered (community) systems.
- Total needs: \$74.7 billion.
- Change in total needs from 2012: Increase of 172 percent (\$47.3 billion).
- Number of states reporting needs: 43.
- States with the highest reported needs: Florida (\$8.3 billion), Texas (\$7.2 billion), New York (\$6.7 billion), Georgia (\$6.0 billion), and North Carolina (\$5.2 billion).
- States with the largest per capita needs: Maine (\$1,254), New Hampshire (\$909), Iowa (\$743), Wisconsin (\$603), and Georgia (\$562).

¹⁷ These numbers represent the number of reuse discharge types; because some treatment plants may discharge to more than one type of reuse, the number of treatment plants may be double counted.

Discussion

Decentralized wastewater treatment systems include both individual on-site septic systems and clustered systems. Examples of clustered systems include small collection systems that feed into a common septic tank and drainfield, as well as small package treatment plants. (The needs for these package treatment plant systems may be included elsewhere in this Report, since it was up to the state coordinator to determine whether a project constituted a Category XII decentralized system or a Category I or II POTW.)

Needs of Note

Alabama used the *Black Belt Region Wastewater Funding Needs* report, developed by the Universities of Alabama and South Alabama, to document \$1.4 billion in Category XII needs. The report details decentralized wastewater needs in 16 Alabama counties that are all characterized by low population density, low economic development, and impermeable clay soils in which conventional septic systems do not work. The report identifies the locations and cost estimates for both clustered and traditional decentralized systems in each of the 16 counties.

The needs for the rehabilitation, replacement, or new installation of decentralized wastewater treatment systems increased by 172 percent (\$47.3 billion) since 2012.¹⁸ One key factor in this increase was the number of states reporting needs, which rose from 27 in 2012 to 43 in 2022. The EPA also developed a CET to assign costs for documented decentralized projects without detailed cost estimates. About 80 percent (\$60.0 billion) of the costs for Category XII were generated using the EPA's CET.

The EPA also saw an increase in the use of state-specific approaches to document needs in this category. Eighty-eight percent (\$66.1 billion) of the needed projects were supported by these approaches, many of which used septic system installation permit data in conjunction with the EPA's CETs to estimate a 20-year need.

Reported decentralized needs continued to be highest in Florida, with Texas, New York, Georgia, and North Carolina moving into the top five states reporting needs. As with Category VII, many states did not have data on the number of needed decentralized wastewater treatment systems and did not have statewide databases of construction costs. Also, some state CWSRF programs do not fund decentralized projects and therefore may not have reported these needs.

Desalination (Category XIV)

Highlights

- Category definition: The capital costs associated with the treatment and disposal of brine, desalination of brackish water to augment water supply, aquifer recharge using desalinated sea water, and treatment/reinjection of brackish groundwater.
- Total needs: \$201 million.
- Change in total needs from 2012: Not reported in 2012.
- Number of states reporting needs: 2.
- States with reported needs: Texas (\$201 million, representing 99 percent of the need) and New Jersey.

¹⁸ Category XII needs were reported in Appendix D of the 2012 Report rather than the main body since they were not specifically identified in CWA section 516(b)(1)(B). Since that time, both the CWSRF eligibilities and CWNS data collection requirements have been amended in the CWA.

Discussion

Category XIV needs have not been reported in a separate category in previous surveys; they may have been included in Categories I or II. Investments in desalination were relatively low compared to investments in other categories; only Texas and New Jersey reported Category XIV needs, with the vast majority in Texas.

Needs of Note

Texas' Brackish Carrizo-Wilcox Project plans to treat brackish groundwater to augment drinking water supplies in Guadalupe and Wilson counties. The project includes a 17.1 million gallon per day treatment plant with desalination, along with new drinking water infrastructure and additional wastewater infrastructure. The resulting brine wastes will be injected into five approved injection wells for disposal of desalination concentrate.

7. Urban and Rural Area Needs

Data from the 2022 CWNS and the U.S. Census Bureau were used to classify reported needs in urban¹⁹ and rural areas in the United States. NPS Control (Category VII) and Decentralized Wastewater Treatment Systems (Category XII) needs presented in this Report are not included in this section because many were reported at the state or county level. Therefore, the EPA could not reasonably determine the distribution of urban and rural needs for Categories VII and XII.

The distribution of urban and rural total reported needs for wastewater and stormwater infrastructure is \$404.0 billion (88 percent) urban and \$57.0 billion (12 percent) rural. Total urban needs for wastewater treatment and collection (Categories I through V) equal \$300.0 billion (89 percent). Total rural needs for these categories equal \$37.8 billion (11 percent).

The majority of the needs in urban areas (67 percent) were in the following three categories: Conveyance System Repair (Category III) at \$98.1 billion, Stormwater Management (Category VI) at \$97.6 billion, and Advanced Wastewater Treatment (Category II) at \$74.8 billion. For rural areas, most of the needs (68 percent) were in the following three categories: Stormwater Management (Category VI) at \$17.7 billion, Conveyance System Repair (Category III) at \$12.0 billion, and Secondary Wastewater Treatment (Category I) at \$9.0 billion. Notably, both the Stormwater Management and Conveyance System Repair needs categories were in the top three for both urban and rural areas. Reported needs for Advanced Wastewater Treatment were proportionally greater in urban areas than in rural areas, but needs for Decentralized Wastewater Treatment Systems made up a greater proportion of the needs in rural areas.

¹⁹ The 2020 Census defines an "urban area" as "a densely settled core of census blocks that meet minimum housing unit density and/or population density requirements. This includes adjacent territory containing non-residential urban land uses. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,000 housing units or have a population of at least 5,000." Previously, the minimum was 2,500 people. All areas not classified as urban by the U.S. Census Bureau were considered rural for this Report.

Small Community Wastewater Needs

The small percentage of total national needs that were reported in rural areas may be due in part to the lack of responses from small communities. For the purposes of the CWNS, small communities are defined as those with populations of 10,000 or fewer. (States designated submissions as serving small communities using a checkbox during data entry. The EPA also included communities in the small-community analysis based on the reported population served.^{20,21})

Over 60 percent (14,457) of wastewater submissions (e.g., collection systems, treatment plants, pump stations) were for communities identified as small. The needs captured by those submissions apply to only 12 percent (32.8 million people) of the U.S. population and account for \$47.1 billion in wastewater needs. This represents 14 percent of the \$345.7 billion total reported wastewater needs. Table 5 presents small community wastewater needs by category.

Table 5. 2022 CWNS Small Community Wastewater Needs by Category (January 2022 Dollars in Billions)

| Category Number | Category Name | \$Billion |
|-----------------|---|---------------|
| I | Secondary Wastewater Treatment | \$11.5 |
| II | Advanced Wastewater Treatment | \$12.1 |
| III and IV | Conveyance System Repair and New Conveyance Systems | \$21.9 |
| V | CSO Correction | \$1.2 |
| X | Water Reuse | \$0.4 |
| Total | | \$47.1 |

The states with the highest reported needs for communities identified as small were Utah (\$5.2 billion), West Virginia (\$2.6 billion), New York (\$2.3 billion), Massachusetts (\$2.1 billion), and Wisconsin (\$1.9 billion). These states accounted for about 30 percent of the small community wastewater needs.

As with previous surveys, the reported needs likely underestimate the actual need in small communities. Of the 14,457 wastewater submissions meeting the survey's criteria for such communities, only 41 percent (5,976 submissions) reported needs. State coordinators indicated that eliciting small community responses to the survey was difficult due to insufficient staff capacity in such communities, potential distrust of the EPA, and lack of understanding of the survey's purpose. In anticipation of these challenges, and because many communities lack the capacity for capital improvement planning, the EPA developed an online form specifically for small communities that would serve as an alternative form of documentation. Despite this resource and additional outreach, only 6 percent of the small community forms sent out by state coordinators were returned. Some state coordinators also noted that they focused their limited resources on collecting data for larger communities with readily available documentation and higher potential needs per project, to the detriment of small community needs collection. Given that most small communities are in rural areas, this underestimation of wastewater needs in small communities affects the proportion of rural needs.

20 While population served by centralized wastewater treatment can approximate a community's population, it does not account for any population served by decentralized wastewater treatment such as individual septic systems.

21 Needs for wastewater submissions serving populations of 10,000 or fewer that were part of larger sewersheds were not included: the EPA presumed that these treatment plants were serving parts of large communities.



Construction of an ocean outfall pipe as part of upgrades to the local wastewater treatment plant to eliminate discharges to the Lewes and Rehoboth Canal in DE. *Photo Credit: Delaware SRF.*

8. Trends in the Nation's Ability to Provide Wastewater Treatment

As of January 1, 2022, submitted survey data indicated that 17,544 POTWs served 270.4 million Americans, or 82 percent of the population.²² Of the total U.S. population, about 70 percent are served by POTWs with secondary or advanced treatment (233.6 million people). Table 6 presents the level of centralized treatment provided based on the data presented in both this Report and in past surveys. This table does not include populations served by decentralized wastewater treatment, such as private septic systems, or the estimated population of 2.2 million people without access to basic running water or indoor plumbing.

Centralized Wastewater Treatment in 2022

- 17,544 publicly owned treatment works
- 270.4 million Americans served
- 82 percent of the population

Since the passage of the CWA in 1972, the level of wastewater treatment provided to the public has vastly improved. The number of people served by advanced wastewater treatment grew from 7.8 million in 1972 to an estimated 139.3 million in 2022 (Figure 7). Furthermore, the population served by less-than-secondary treatment has decreased from almost 60 million (28 percent of total population) in 1972 to an estimated 3.8 million in 2022 (one percent of the total population).

²² Total population from the 2020 U.S. Census: <https://www2.census.gov/programs-surveys/decennial/2020/data/apportionment/apportionment-2020-table02.xlsx>.

Based on current data trends, the nation continues to make progress toward eliminating raw and less-than-secondary-treated effluent discharged to the nation's surface water bodies. The number of facilities that provide less-than-secondary treatment is projected to decline from 65 to 58, although the populations served by these facilities are projected to increase slightly from 3.8 million to 4.0 million people over the next 20 years. As mentioned in the introduction, most of the reported needs (and associated technical data) came from documents with 5- to 10-year planning horizons. The projected number of new treatment plants may therefore be undercounted. Overall, projections based on the survey data suggest that a total of 17,679 operational facilities will serve a future population of 287.4 million people in 2042.

In addition to effluent treatment level, the 2022 CWNS collected data on discharge methods. Some facilities split their effluent between surface water and non-discharging, while other facilities were 100 percent non-discharging. ("Non-discharging" refers to effluent that is not discharged to surface waters but instead is evaporated or reused for beneficial purposes—e.g., spray irrigation, groundwater recharge.) The population served by facilities that are fully or partially non-discharging increased from 16 million in 2012 to 33.0 million—or 10 percent of the U.S. population—in 2022. Of the 2,543 facilities that are 100 percent non-discharging, one percent currently provide less-than-secondary treatment, 78 percent provide secondary treatment, and 21 percent provide advanced treatment. Survey results indicate that if the wastewater treatment needs (Categories I and II) reported in the survey are met and water reuse becomes more widely adopted, the number of non-discharging facilities is projected to increase from 2,543 to 2,710 and the population served by those facilities is projected to increase by 21 percent (8.8 million people).

EPA Program Highlight

The EPA and U.S. Department of Agriculture Rural Development, in collaboration with states, are partnering on the Closing America's Wastewater Access Gap Community Initiative. They will jointly leverage technical assistance resources to help historically underserved communities identify, and pursue, federal funding opportunities to address their wastewater needs. For more information, visit <https://www.epa.gov/water-infrastructure/closing-americas-wastewater-access-gap-community-initiative>.



Repairs underway on the Hampton Roads Sanitation District wastewater system in VA. *Photo Credit: Virginia Department of Environmental Quality.*

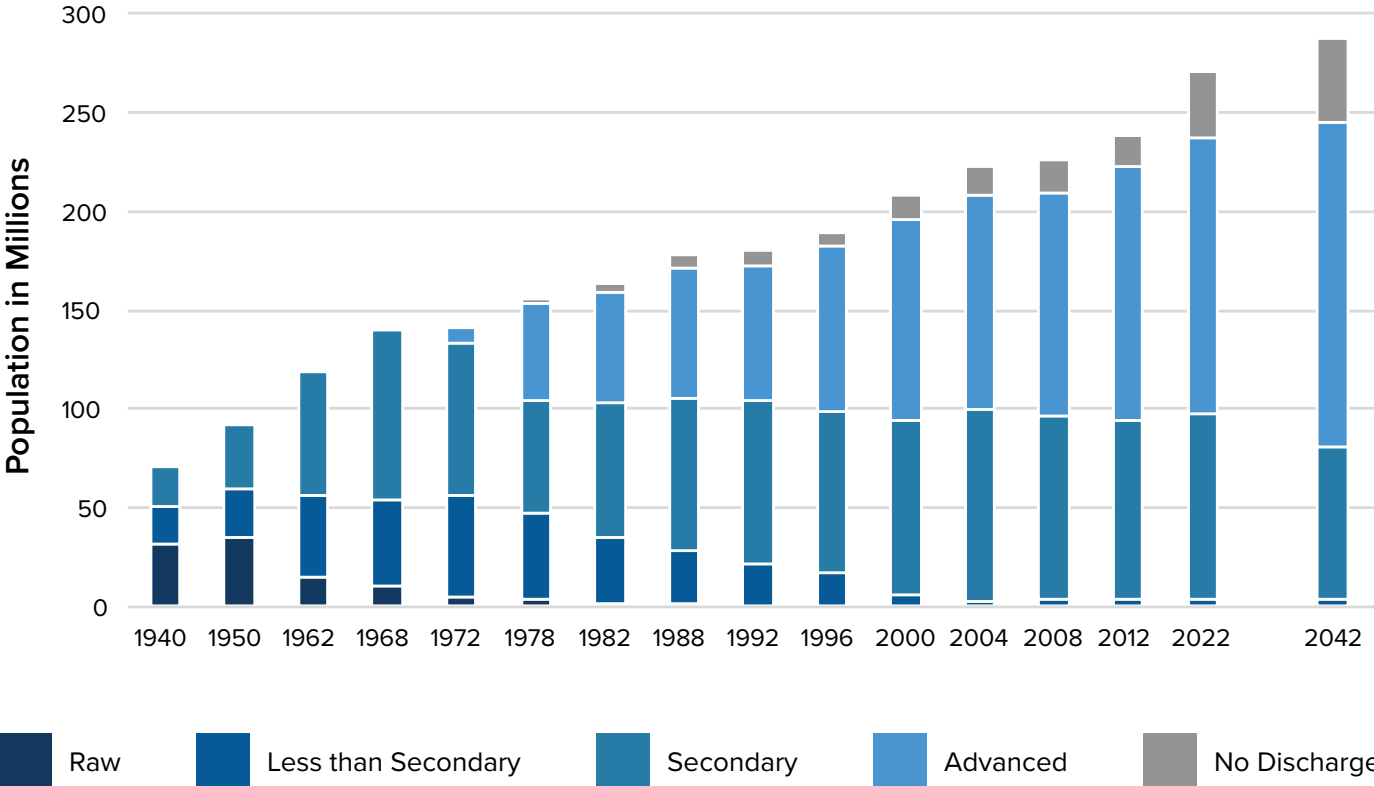


Figure 7. Population Served by POTWs for Select Years Between 1940 and 2022 and Projected (If All Needs Are Met) by Treatment Level

Table 6. Changes over Time in POTW Discharge to Surface Water

| Treatment Level and Discharge Location ^a | Population Served in Millions (Number of Facilities) | | | | Population Change 2012–2022 | Projected Population Change 2022–2042 |
|---|---|---------------------------|---------------------------|---------------------------|--------------------------------|--|
| | 2008 | 2012 | 2022 | 2042 | | |
| Less-than-secondary discharge to surface water | 3.8 (30) | 4.1 (34) | 3.8 (65) | 4.0 (58) | -7% | 4% |
| Secondary discharge to surface water ^b | 92.7 (7,417) | 90.4 (7,397) | 94.3 (8,769) | 77.1 (8,058) | 4% | -22% |
| Advanced discharge to surface water | 113.0 (5,072) | 127.7 (5,036) | 139.3 (6,167) | 164.6 (6,853) | 8% | 15% |
| No discharge to surface water ^c | 16.9 (2,251) | 16.0 (2,281) | 33.0 (2,543) | 41.8 (2,710) | 52% | 21% |
| Total | 226.4 (14,770) | 238.2 (14,748) | 270.4 (17,544) | 287.4 (17,679) | 12% | 6% |

^a This table includes survey response data as well as best available information for states that did not have the resources to update the data for all facilities. For the latter, information for this table was taken from previous surveys.

^b Includes facilities reported as “Partial Treatment” in previous surveys. Data indicate that these were primarily facilities that discharged to other facilities.

^c The number of “No Discharge” facilities represents only treatment plants that are 100 percent non-discharging. Facilities that partially discharge to surface water and are partially non-discharging are included under the surface water discharge entries. However, the population served by these partial discharge/partial non-discharge facilities is accounted for proportionally under each entry based on percent of flow. Therefore, neither the number of facilities nor populations are double counted.

Appendix A: 2022 CWNS Needs Categories Definitions

Table A-1. 2022 CWNS Needs Categories Definitions

| 2022 Category Number | Category Name | Description |
|----------------------|-----------------------------------|---|
| I | Secondary Wastewater Treatment | <p>This category includes needs for meeting secondary treatment criteria. Secondary treatment typically requires a treatment level that produces an effluent quality of 30 milligrams per liter of both 5-day biochemical oxygen demand (BOD₅) and total suspended solids. (Secondary treatment levels required for some lagoon systems may be less stringent.) In addition, the secondary treatment must remove 85 percent of BOD₅ and total suspended solids from the influent wastewater.</p> <p>This category also includes facilities granted waivers of secondary treatment for marine discharges under section 301(h) of the CWA and “honey bucket lagoons,” though they do not provide secondary treatment.</p> |
| II | Advanced Wastewater Treatment | <p>This category includes needs for attaining or maintaining a level of treatment that is more stringent than secondary treatment or producing a significant reduction in nonconventional or toxic pollutants in the wastewater treated by a facility. A facility is considered to have advanced wastewater treatment if it achieves one or more of the following: BOD₅ less than 20 milligrams per liter, nitrogen removal, phosphorus removal, ammonia removal, metal removal, or synthetic organic removal.</p> |
| III-A | I/I Correction | <p>This category includes needs for correction of sewer system I/I problems. For infiltration, this includes controlling the penetration of water into a sanitary or combined sewer system from the ground through defective pipes or manholes. For inflow, it includes controlling the penetration of water into the system from drains, storm sewers, and other improper entries. It also includes costs for preliminary sewer system analysis and detailed sewer system evaluation surveys.</p> |
| III-B | Sewer Replacement/ Rehabilitation | <p>This category includes needs for the maintenance (above and beyond ongoing operations and maintenance), reinforcement, or reconstruction of structurally deteriorating sanitary or combined sewers. The corrective actions must be necessary to maintain the structural integrity of the system.</p> |

| 2022 Category Number | Category Name | Description |
|----------------------|--|---|
| IV-A | New Collector Sewers and Appurtenances | This category includes needs for new pipes used to collect wastewater from a sanitary or industrial wastewater source and carry it to an interceptor sewer that will convey it to a treatment facility. |
| IV-B | New Interceptor Sewers and Appurtenances | This category includes needs for constructing new interceptor sewers and pumping stations to convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. Needs for relief sewers are included in this category. |
| V | CSO Correction | This category includes needs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater (CSOs) that occur when the capacity of a sewer system is exceeded during a wet weather event. This category does not include needs for overflow control allocated to flood control, drainage improvement, or the treatment or control of stormwater in separate storm systems. |
| VI-A | Gray Infrastructure | This category includes needs for stormwater management program activities associated with the planning, design, and construction of stormwater conveyance structures (e.g., pipes, inlets, roadside ditches, and other similar mechanisms). This category also includes needs associated with the planning, design, and construction of structural BMPs that treat stormwater (e.g., wet ponds, dry ponds, manufactured devices). |
| VI-B | Green Infrastructure | This category includes needs for stormwater management program activities associated with the planning, design, and construction of low-impact development and green infrastructure (e.g., bioretention, constructed wetlands, permeable pavement, rain gardens, green roofs, cisterns, rain barrels, vegetated swales, restoration of riparian buffers and flood plains). |
| VI-C | General Stormwater Management | This category includes needs for activities associated with implementing a stormwater management program. These needs can include geographic information systems and tracking systems, equipment (e.g., street sweepers, vacuum trucks), stormwater education program startup costs (e.g., setting up a stormwater public education center, building a traveling stormwater education display), and stormwater management plan development. |

| 2022 Category Number | Category Name | Description |
|----------------------------|---|---|
| VII-A | NPS Control: Agriculture (Cropland) | This category includes costs to address NPS pollution control needs associated with agricultural activities related to croplands. These activities include plowing, pesticide spraying, irrigation, fertilizing, planting, and harvesting. Examples of BMPs used to address these needs are conservation tillage, nutrient management, and irrigation water management. |
| VII-B | NPS Control: Agriculture (Animals) | This category includes all costs that address NPS pollution control needs associated with agricultural activities related to animal production (e.g., confined animal facilities and grazing). Some typical BMPs used to address agriculture (animal) needs are animal waste storage facilities, animal waste nutrient management, composting facilities, and planned grazing. Any costs associated with facilities or measures that address point source pollution discharges are not reported in this category. |
| VII-C | NPS Control: Silviculture | This category includes all costs that address NPS pollution control needs associated with forestry activities, such as removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for tree planting. Some typical BMPs used to address silviculture needs are pre-harvest planning, streamside buffers, road management, revegetation of disturbed areas, structural practices (e.g., sediment control structure), and equipment (e.g., timber harvesting equipment). |
| VII-E | NPS Control: Groundwater Protection (Unknown Source) | This category includes all costs that address groundwater protection NPS pollution control needs, such as wellhead and recharge area protection activities. Any need that can be attributed to a specific cause of groundwater pollution, such as leaking storage tanks, soil contamination in a brownfield, or leachate from a sanitary landfill, is reported in the appropriate specific category. |
| VII-F | NPS Control: Marinas | This category includes all costs that address NPS pollution control needs associated with boating and marinas, such as poorly flushed waterways; boat maintenance activities; discharge of sewage from boats; and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. Some typical BMPs used to address needs at marinas are bulk heading, pump-out systems, and oil containment booms. |

| 2022 Category Number | Category Name | Description |
|----------------------------|------------------------------------|---|
| VII-G | NPS Control: Resource Extraction | This category includes all costs that address NPS pollution control needs associated with mining and quarrying activities. Some typical BMPs used to address resource extraction needs are detention berms, adit (mine entrance) closures, and seeding or revegetation. Any costs associated with facilities or measures that address point source discharges are not reported in this category. |
| VII-H | NPS Control: Brownfields/Superfund | This category includes all costs that address NPS pollution control needs associated with 1) abandoned industrial sites that might have residual contamination (brownfields) and 2) hazardous waste sites covered under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund sites). All costs for work at brownfield or Superfund sites, regardless of the activity, should be included in this category. Some typical BMPs used to address needs at brownfield or Superfund sites are excavation, removal, and disposal of contaminated sediment/soil; cleanup of contaminated groundwater or surface water; and capping of wells to prevent stormwater infiltration. |
| VII-I | NPS Control: Storage Tanks | This category includes all costs that address NPS pollution control needs associated with tanks designed to hold gasoline, other petroleum products, or chemicals. The tanks may be above or below ground level. Some typical BMPs used to address storage tank needs are spill containment systems; in situ treatment of contaminated soils and groundwater; and upgrade, rehabilitation, or removal of petroleum/chemical storage tanks. If these facilities or measures are part of addressing NPS needs at brownfields, the costs go in Category VII-H, "NPS Control: Brownfields/Superfund." |
| VII-J | NPS Control: Sanitary Landfills | This category includes all costs that address NPS pollution control needs associated with sanitary landfills. Some typical BMPs used to address needs at landfills are leachate collection, on-site treatment, gas collection and control, capping, and closure. |

| 2022 Category Number | Category Name | Description |
|----------------------------|---|--|
| VII-K | NPS Control: Hydromodification | <p>This category includes needs to address the degradation of water resources as a result of altering the hydrological characteristics of coastal and non-coastal waters. For a stream channel, hydromodification is the process of the stream bank being eroded by flowing water, typically resulting in the suspension of sediments in the watercourse. Examples of such hydromodification activities include channelization and channel modification, dams, and stream bank and shoreline erosion. Some typical BMPs used to address hydromodification needs are conservation easements, swales, filter strips, shore erosion control, wetland development or restoration, and bank or channel (grade) stabilization. This category includes any work involving wetland or riparian area protection or restoration.</p> |
| VII-M | NPS Control: Other Estuary Management Activities | <p>This category is only used for management activities in the study areas of the 28 National Estuary Programs (NEPs) designated under section 320 of the CWA. It includes costs associated with a limited number of estuary management activities that may not be appropriately included in other need categories. Some typical estuary BMPs are habitat protection for aquatic species; fishery, oyster bed, and shellfish restocking and restoration; fish ladders; rejuvenation of submerged aquatic vegetation; artificial reef establishment; control of invasive vegetative and aquatic species; and water control structures for flow regime and salinity. Point source technologies included in the NEP's Comprehensive Conservation and Management Plans should not be included in this category.</p> |
| X | Water Reuse | <p>This category includes needs associated with conveyance of treated wastewater that is being reused, including associated rehabilitation/replacement needs. Examples are pipes to convey treated water from the wastewater facility to the drinking water distribution system or the drinking water treatment facility and equipment for application of effluent on publicly owned land.</p> <p>The needs associated with additional unit processes to increase the level of treatment to potable—or less than potable but greater than the level normally associated with surface discharge needs—are reported in Category II.</p> |

| 2022 Category Number | Category Name | Description |
|----------------------------|--|--|
| XII | Decentralized Wastewater Treatment Systems | <p>This category includes needs associated with the rehabilitation, replacement, or new installation of on-site wastewater treatment systems or clustered (community) systems. It also includes the treatment portion of other decentralized sewage disposal technologies. Costs related to the development and implementation of on-site management districts are included (but not the costs of ongoing operations of such districts). Costs could also include the limited collection systems associated with the decentralized system. Public ownership is not required for decentralized systems.</p> <p>This category does not include the needs to change a service area from decentralized wastewater treatment to a publicly owned centralized treatment system. Needs to construct a publicly owned centralized collection and treatment system should be reported in Category I and/or Category II. Needs to install sewers to connect the service area to an existing collection system are reported in Category IV-A and Category IV-B.</p> |
| XIV | Desalination | <p>This category includes needs for treatment and disposal of brine, desalination of brackish water to augment water supply, aquifer recharge using desalinated sea water, and treatment/reinjection of brackish groundwater.</p> |

Appendix B: 2022 CWNS Reported Needs by Category

Table B-1. 2022 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)

| State | Needs Category | | | | | | | | | | |
|----------------------|----------------|---------|----------|----------|---------|---------|----------|----------|---------|---------|-----|
| | Total | I | II | III | IV | V | VI | VII | X | XII | XIV |
| Alabama | \$4,026 | \$782 | \$51 | \$1,127 | \$350 | NR | \$59 | \$277 | NR | \$1,380 | NR |
| Alaska | \$775 | \$287 | NR | \$233 | \$181 | NR | \$56 | \$19 | <\$0.5 | <\$0.5 | NR |
| American Samoa | \$30 | \$30 | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Arizona | \$4,784 | \$64 | \$1,584 | \$1,572 | \$553 | NR | \$757 | NR | \$227 | \$27 | NR |
| Arkansas | \$5,453 | \$545 | \$913 | \$1,310 | \$397 | NR | \$811 | \$942 | \$3 | \$533 | NR |
| California | \$65,533 | \$7,024 | \$10,776 | \$12,506 | \$2,528 | \$126 | \$16,219 | \$9,215 | \$3,757 | \$3,382 | NR |
| Colorado | \$19,170 | \$602 | \$5,633 | \$2,675 | \$804 | \$8 | \$4,410 | \$4,921 | \$117 | NR | NR |
| Connecticut | \$9,825 | \$76 | \$2,220 | \$1,415 | \$317 | \$2,947 | \$1,335 | \$46 | \$2 | \$1,468 | NR |
| Delaware | \$1,265 | \$160 | \$142 | \$650 | \$170 | \$9 | \$16 | \$110 | \$7 | NR | NR |
| District of Columbia | \$2,220 | NR | \$429 | \$1,332 | NR | \$397 | \$62 | NR | NR | NR | NR |
| Florida | \$46,559 | NR | \$13,863 | \$5,306 | \$5,266 | NR | \$12,039 | \$871 | \$951 | \$8,264 | NR |
| Georgia | \$25,569 | \$1,037 | \$7,081 | \$4,458 | \$2,308 | \$255 | \$3,985 | \$259 | \$167 | \$6,017 | NR |
| Guam | \$479 | \$287 | NR | \$192 | NR | NR | NR | NR | NR | NR | NR |
| Hawaii | \$3,336 | \$1,008 | \$33 | \$1,715 | \$392 | \$38 | NR | \$74 | \$76 | NR | NR |
| Idaho | \$2,586 | \$754 | \$871 | \$419 | \$117 | NR | \$33 | \$370 | \$22 | NR | NR |
| Illinois | \$11,375 | \$404 | \$4,070 | \$2,071 | \$392 | \$571 | \$640 | \$3,227 | NR | NR | NR |
| Indiana | \$10,132 | \$230 | \$1,279 | \$1,126 | \$846 | \$2,927 | \$531 | \$2,006 | NR | \$1,187 | NR |
| Iowa | \$12,299 | \$313 | \$3,105 | \$391 | \$311 | \$116 | \$1,966 | \$3,727 | NR | \$2,370 | NR |
| Kansas | \$4,239 | \$110 | \$1,279 | \$353 | \$225 | \$107 | \$183 | \$1,082 | \$8 | \$892 | NR |
| Kentucky | \$7,483 | \$2,897 | \$111 | \$1,503 | \$1,126 | \$891 | \$48 | \$886 | \$1 | \$21 | NR |
| Louisiana | \$26,904 | \$306 | \$446 | \$1,203 | \$449 | NR | \$1,344 | \$22,032 | NR | \$1,125 | NR |

| State | Needs Category | | | | | | | | | | |
|--------------------|----------------|----------|---------|----------|---------|---------|---------|---------|-------|---------|--------|
| | Total | I | II | III | IV | V | VI | VII | X | XII | XIV |
| Maine | \$3,995 | \$513 | \$274 | \$498 | \$93 | \$311 | \$275 | \$322 | NR | \$1,709 | NR |
| Maryland | \$10,657 | \$27 | \$2,711 | \$2,686 | \$916 | \$483 | \$1,384 | \$2,211 | \$2 | \$236 | NR |
| Massachusetts | \$21,710 | \$2,400 | \$1,215 | \$2,462 | \$3,633 | \$1,451 | \$7,702 | \$2,571 | \$1 | \$275 | NR |
| Michigan | \$15,072 | \$980 | \$181 | \$2,012 | \$32 | \$588 | \$5,953 | \$3,755 | NR | \$1,572 | NR |
| Minnesota | \$6,716 | \$1,230 | \$514 | \$1,353 | \$186 | \$2 | \$47 | \$254 | NR | \$3,131 | NR |
| Mississippi | \$1,933 | \$83 | \$642 | \$405 | \$163 | \$12 | NR | \$628 | NR | NR | NR |
| Missouri | \$9,102 | \$93 | \$2,847 | \$916 | \$916 | \$2,213 | \$840 | \$1,273 | NR | \$5 | NR |
| Montana | \$347 | \$45 | \$107 | \$62 | \$88 | \$3 | \$22 | \$18 | NR | \$1 | NR |
| Nebraska | \$3,171 | \$128 | \$838 | \$413 | \$236 | \$459 | \$107 | \$990 | NR | NR | NR |
| Nevada | \$531 | \$15 | \$120 | \$50 | \$59 | NR | \$4 | \$6 | \$273 | \$3 | NR |
| New Hampshire | \$4,287 | \$501 | \$349 | \$763 | \$251 | \$358 | \$768 | \$37 | \$9 | \$1,252 | NR |
| New Jersey | \$19,352 | \$4,615 | \$284 | \$2,039 | \$1,169 | \$3,605 | \$2,812 | \$1,875 | \$38 | \$2,916 | <\$0.5 |
| New Mexico | \$12,280 | \$267 | \$800 | \$603 | \$341 | NR | \$1,858 | \$7,134 | \$340 | \$938 | NR |
| New York | \$53,917 | \$16,045 | \$810 | \$15,046 | \$3,882 | \$5,988 | \$5,199 | \$252 | \$6 | \$6,689 | NR |
| North Carolina | \$21,136 | \$1,096 | \$4,142 | \$5,185 | \$2,125 | NR | \$2,142 | \$1,201 | \$86 | \$5,160 | NR |
| North Dakota | \$2,621 | \$213 | \$80 | \$462 | \$129 | NR | \$198 | \$1,256 | \$45 | \$239 | NR |
| N. Mariana Islands | \$341 | \$95 | NR | \$156 | \$87 | NR | NR | NR | \$2 | NR | NR |
| Ohio | \$20,555 | \$3,905 | \$637 | \$8,355 | \$1,428 | \$1,507 | \$911 | \$1,606 | \$7 | \$2,199 | NR |
| Oklahoma | \$3,436 | \$681 | \$47 | \$364 | \$562 | \$1 | \$181 | \$325 | \$1 | \$1,273 | NR |
| Oregon | \$5,541 | \$1,386 | \$590 | \$1,554 | \$177 | \$1 | \$417 | \$1,291 | \$94 | \$33 | NR |
| Pennsylvania | \$12,765 | \$2,230 | \$80 | \$1,065 | \$403 | \$4,433 | \$1,947 | \$2,561 | NR | \$46 | NR |
| Puerto Rico | \$2,711 | \$1,127 | \$109 | \$668 | \$548 | NR | \$18 | \$12 | NR | \$229 | NR |
| Rhode Island | \$2,485 | \$265 | \$4 | \$312 | \$369 | \$586 | \$442 | \$58 | NR | \$449 | NR |
| South Carolina | \$7,351 | \$343 | \$1,604 | \$2,574 | \$548 | NR | \$190 | \$338 | \$2 | \$1,753 | NR |

| State | Needs Category | | | | | | | | | | |
|-------------------|------------------|-----------------|-----------------|------------------|-----------------|-----------------|------------------|-----------------|----------------|-----------------|--------------|
| | Total | I | II | III | IV | V | VI | VII | X | XII | XIV |
| South Dakota | \$1,116 | \$292 | \$59 | \$136 | \$16 | NR | \$16 | \$597 | NR | NR | NR |
| Tennessee | \$3,852 | \$503 | \$611 | \$1,502 | \$381 | NR | \$258 | \$596 | NR | \$2 | NR |
| Texas | \$18,857 | \$4,032 | \$596 | \$2,518 | \$669 | \$12 | \$1,543 | \$1,407 | \$659 | \$7,222 | \$201 |
| Utah | \$9,728 | \$155 | \$3,501 | \$2,388 | \$869 | NR | \$1,431 | \$55 | NR | \$1,329 | NR |
| Vermont | \$2,104 | \$265 | \$39 | \$77 | \$32 | \$173 | \$631 | \$789 | NR | \$98 | NR |
| Virgin Islands | \$157 | \$5 | NR | \$111 | \$36 | NR | \$6 | NR | NR | NR | NR |
| Virginia | \$45,770 | \$351 | \$3,637 | \$4,244 | \$2,054 | \$653 | \$30,168 | \$902 | \$710 | \$3,052 | NR |
| Washington | \$18,627 | \$4,334 | \$156 | \$4,292 | \$619 | \$2,427 | \$2,205 | \$2,753 | \$110 | \$1,730 | NR |
| West Virginia | \$11,089 | \$931 | \$149 | \$1,697 | \$574 | \$1,654 | \$415 | \$4,758 | NR | \$912 | NR |
| Wisconsin | \$12,013 | \$327 | \$1,946 | \$1,316 | \$727 | \$1,191 | \$683 | \$2,270 | NR | \$3,553 | NR |
| Wyoming | \$699 | \$234 | NR | \$212 | NR | NR | \$35 | \$206 | \$12 | \$1 | NR |
| Total U.S. | \$630,067 | \$66,623 | \$83,567 | \$110,053 | \$41,048 | \$36,505 | \$115,297 | \$94,367 | \$7,735 | \$74,670 | \$201 |

Categories:

I Secondary Wastewater Treatment
 II Advanced Wastewater Treatment
 III Conveyance System Repair
 IV New Conveyance Systems

V CSO Correction
 VI Stormwater Management
 VII NPS Control

X Water Reuse
 XII Decentralized Wastewater Treatment
 XIV Desalination

Notes:

NR = not reported.

Table B-2. 2022 CWNS Reported Needs for Wastewater Subcategories by Category and State (January 2022 Dollars in Millions)

| State | Needs Category | | | | | | | |
|----------------------|----------------|----------|-------|----------|---------|---------|---------|-----------|
| | I | II | III-A | III-B | IV-A | IV-B | V | Total I-V |
| Alabama | \$782 | \$51 | \$118 | \$1,010 | \$262 | \$88 | NR | \$2,310 |
| Alaska | \$287 | NR | \$3 | \$230 | \$174 | \$6 | NR | \$700 |
| American Samoa | \$30 | NR | NR | NR | NR | NR | NR | \$30 |
| Arizona | \$64 | \$1,584 | \$1 | \$1,571 | \$435 | \$117 | NR | \$3,773 |
| Arkansas | \$545 | \$913 | \$494 | \$816 | \$270 | \$126 | NR | \$3,165 |
| California | \$7,024 | \$10,776 | \$46 | \$12,460 | \$576 | \$1,952 | \$126 | \$32,960 |
| Colorado | \$602 | \$5,633 | \$342 | \$2,333 | \$213 | \$591 | \$8 | \$9,722 |
| Connecticut | \$76 | \$2,220 | \$334 | \$1,080 | \$315 | \$3 | \$2,947 | \$6,975 |
| Delaware | \$160 | \$142 | \$13 | \$637 | \$136 | \$34 | \$9 | \$1,132 |
| District of Columbia | NR | \$429 | NR | \$1,332 | NR | NR | \$397 | \$2,158 |
| Florida | NR | \$13,863 | \$465 | \$4,841 | \$4,622 | \$644 | NR | \$24,434 |
| Georgia | \$1,037 | \$7,081 | \$306 | \$4,153 | \$1,483 | \$825 | \$255 | \$15,140 |
| Guam | \$287 | NR | NR | \$192 | NR | NR | NR | \$479 |
| Hawaii | \$1,008 | \$33 | \$291 | \$1,424 | \$107 | \$285 | \$38 | \$3,186 |
| Idaho | \$754 | \$871 | \$33 | \$386 | \$115 | \$2 | NR | \$2,161 |
| Illinois | \$404 | \$4,070 | \$657 | \$1,414 | \$245 | \$147 | \$571 | \$7,508 |
| Indiana | \$230 | \$1,279 | \$170 | \$956 | \$716 | \$130 | \$2,927 | \$6,409 |
| Iowa | \$313 | \$3,105 | \$64 | \$326 | \$172 | \$139 | \$116 | \$4,236 |
| Kansas | \$110 | \$1,279 | \$47 | \$306 | \$52 | \$173 | \$107 | \$2,075 |
| Kentucky | \$2,897 | \$111 | \$298 | \$1,205 | \$867 | \$258 | \$891 | \$6,528 |
| Louisiana | \$306 | \$446 | \$327 | \$876 | \$401 | \$48 | NR | \$2,404 |
| Maine | \$513 | \$274 | \$42 | \$456 | \$83 | \$10 | \$311 | \$1,689 |
| Maryland | \$27 | \$2,711 | \$625 | \$2,061 | \$866 | \$50 | \$483 | \$6,824 |

| State | Needs Category | | | | | | | Total I-V |
|--------------------|----------------|---------|---------|---------|---------|---------|---------|-----------|
| | I | II | III-A | III-B | IV-A | IV-B | V | |
| Massachusetts | \$2,400 | \$1,215 | \$628 | \$1,834 | \$2,599 | \$1,034 | \$1,451 | \$11,160 |
| Michigan | \$980 | \$181 | \$76 | \$1,936 | \$17 | \$14 | \$588 | \$3,792 |
| Minnesota | \$1,230 | \$514 | \$146 | \$1,207 | \$131 | \$55 | \$2 | \$3,285 |
| Mississippi | \$83 | \$642 | \$24 | \$381 | \$23 | \$141 | \$12 | \$1,305 |
| Missouri | \$93 | \$2,847 | \$300 | \$615 | \$530 | \$386 | \$2,213 | \$6,985 |
| Montana | \$45 | \$107 | \$5 | \$57 | \$49 | \$40 | \$3 | \$306 |
| Nebraska | \$128 | \$838 | \$36 | \$377 | \$80 | \$156 | \$459 | \$2,074 |
| Nevada | \$15 | \$120 | \$5 | \$46 | \$59 | NR | NR | \$245 |
| New Hampshire | \$501 | \$349 | \$36 | \$726 | \$147 | \$104 | \$358 | \$2,221 |
| New Jersey | \$4,615 | \$284 | \$315 | \$1,724 | \$885 | \$284 | \$3,605 | \$11,712 |
| New Mexico | \$267 | \$800 | \$4 | \$599 | \$329 | \$12 | NR | \$2,010 |
| New York | \$16,045 | \$810 | \$599 | \$4,447 | \$3,643 | \$239 | \$5,988 | \$41,771 |
| North Carolina | \$1,096 | \$4,142 | \$282 | \$4,904 | \$725 | \$1,400 | NR | \$12,548 |
| North Dakota | \$213 | \$80 | \$96 | \$366 | \$36 | \$92 | NR | \$884 |
| N. Mariana Islands | \$95 | NR | \$4 | \$153 | \$87 | NR | NR | \$339 |
| Ohio | \$3,905 | \$637 | \$3,315 | \$5,040 | \$550 | \$877 | \$1,507 | \$15,832 |
| Oklahoma | \$681 | \$47 | \$4 | \$360 | \$57 | \$505 | \$1 | \$1,656 |
| Oregon | \$1,386 | \$590 | \$113 | \$1,441 | \$176 | <\$0.5 | \$1 | \$3,707 |
| Pennsylvania | \$2,230 | \$80 | \$41 | \$1,023 | \$263 | \$140 | \$4,433 | \$8,210 |
| Puerto Rico | \$1,127 | \$109 | \$9 | \$660 | \$548 | NR | NR | \$2,452 |
| Rhode Island | \$265 | \$4 | \$17 | \$295 | \$311 | \$58 | \$586 | \$1,536 |
| South Carolina | \$343 | \$1,604 | \$6 | \$2,568 | \$448 | \$100 | NR | \$5,069 |
| South Dakota | \$292 | \$59 | \$18 | \$118 | \$5 | \$12 | NR | \$503 |
| Tennessee | \$503 | \$611 | \$294 | \$1,208 | \$50 | \$332 | NR | \$2,997 |

| State | Needs Category | | | | | | | |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| | I | II | III-A | III-B | IV-A | IV-B | V | Total I–V |
| Texas | \$4,032 | \$596 | \$253 | \$2,265 | \$212 | \$458 | \$12 | \$7,827 |
| Utah | \$155 | \$3,501 | \$83 | \$2,305 | \$703 | \$166 | NR | \$6,913 |
| Vermont | \$265 | \$39 | \$3 | \$74 | \$32 | NR | \$173 | \$585 |
| Virgin Islands | \$5 | NR | NR | \$111 | \$36 | NR | NR | \$151 |
| Virginia | \$351 | \$3,637 | \$604 | \$3,640 | \$1,367 | \$687 | \$653 | \$10,939 |
| Washington | \$4,334 | \$156 | \$202 | \$4,091 | \$471 | \$148 | \$2,427 | \$11,828 |
| West Virginia | \$931 | \$149 | \$392 | \$1,305 | \$506 | \$67 | \$1,654 | \$5,005 |
| Wisconsin | \$327 | \$1,946 | \$50 | \$1,266 | \$248 | \$479 | \$1,191 | \$5,508 |
| Wyoming | \$234 | NR | NR | \$212 | NR | NR | NR | \$446 |
| Total U.S. | \$66,623 | \$83,567 | \$12,638 | \$97,416 | \$27,433 | \$13,616 | \$36,505 | \$337,796 |

Categories:

| | | | | | |
|-------|--------------------------------|-------|--|------|--|
| I | Secondary Wastewater Treatment | III-B | Sewer Replacement/Rehabilitation | IV-B | New Interceptor Sewers and Appurtenances |
| II | Advanced Wastewater Treatment | IV-A | New Collector Sewers and Appurtenances | V | CSO Correction |
| III-A | I/I Correction | | | | |

Notes:

NR = not reported.

Table B-3. 2022 CWNS Reported Needs for Stormwater Management by Category and State (January 2022 Dollars in Millions)

| State | Needs Category | | | |
|----------------------|----------------|---------|---------|----------|
| | VI-A | VI-B | VI-C | Total VI |
| Alabama | \$17 | \$1 | \$41 | \$59 |
| Alaska | \$51 | \$5 | <\$0.5 | \$56 |
| American Samoa | NR | NR | NR | NR |
| Arizona | \$697 | \$57 | \$3 | \$757 |
| Arkansas | \$745 | \$59 | \$7 | \$811 |
| California | \$9,042 | \$6,943 | \$233 | \$16,219 |
| Colorado | \$4,169 | \$133 | \$109 | \$4,410 |
| Connecticut | \$207 | \$1,073 | \$55 | \$1,335 |
| Delaware | NR | NR | \$16 | \$16 |
| District of Columbia | \$61 | NR | \$1 | \$62 |
| Florida | \$11,366 | \$118 | \$556 | \$12,039 |
| Georgia | \$2,679 | \$1,190 | \$116 | \$3,985 |
| Guam | NR | NR | NR | NR |
| Hawaii | NR | NR | NR | NR |
| Idaho | NR | NR | \$33 | \$33 |
| Illinois | \$437 | \$198 | \$5 | \$640 |
| Indiana | \$497 | \$34 | NR | \$531 |
| Iowa | \$303 | \$1,586 | \$76 | \$1,966 |
| Kansas | \$136 | \$14 | \$33 | \$183 |
| Kentucky | NR | \$16 | \$32 | \$48 |
| Louisiana | \$1,017 | \$192 | \$135 | \$1,344 |
| Maine | \$20 | \$239 | \$16 | \$275 |
| Maryland | \$605 | \$703 | \$76 | \$1,384 |
| Massachusetts | \$604 | \$3,371 | \$3,726 | \$7,702 |
| Michigan | \$5,856 | \$97 | <\$0.5 | \$5,953 |
| Minnesota | \$5 | \$39 | \$2 | \$47 |
| Mississippi | NR | NR | NR | NR |
| Missouri | \$745 | \$93 | \$2 | \$840 |
| Montana | \$22 | NR | NR | \$22 |
| Nebraska | \$57 | <\$0.5 | \$49 | \$107 |
| Nevada | \$4 | NR | NR | \$4 |

| State | Needs Category | | | |
|--------------------|-----------------|-----------------|----------------|------------------|
| | VI-A | VI-B | VI-C | Total VI |
| New Hampshire | \$489 | \$206 | \$73 | \$768 |
| New Jersey | \$2,388 | \$172 | \$252 | \$2,812 |
| New Mexico | \$1,790 | \$18 | \$50 | \$1,858 |
| New York | \$4,950 | \$236 | \$12 | \$5,199 |
| North Carolina | \$1,790 | \$258 | \$93 | \$2,142 |
| North Dakota | \$194 | \$1 | \$3 | \$198 |
| N. Mariana Islands | NR | NR | NR | NR |
| Ohio | \$845 | \$62 | \$5 | \$911 |
| Oklahoma | \$152 | NR | \$29 | \$181 |
| Oregon | \$355 | \$54 | \$8 | \$417 |
| Pennsylvania | \$394 | \$1,504 | \$50 | \$1,947 |
| Puerto Rico | NR | \$4 | \$14 | \$18 |
| Rhode Island | \$92 | \$347 | \$3 | \$442 |
| South Carolina | \$89 | \$49 | \$52 | \$190 |
| South Dakota | \$16 | NR | NR | \$16 |
| Tennessee | \$159 | \$31 | \$67 | \$258 |
| Texas | \$1,460 | \$81 | \$2 | \$1,543 |
| Utah | \$1,400 | \$31 | <\$0.5 | \$1,431 |
| Vermont | \$631 | NR | NR | \$631 |
| Virgin Islands | \$6 | NR | NR | \$6 |
| Virginia | \$1,055 | \$29,108 | \$4 | \$30,168 |
| Washington | \$1,215 | \$902 | \$89 | \$2,205 |
| West Virginia | \$381 | \$27 | \$6 | \$415 |
| Wisconsin | \$547 | \$69 | \$66 | \$683 |
| Wyoming | \$28 | \$6 | NR | \$35 |
| Total U.S. | \$59,769 | \$49,329 | \$6,199 | \$115,297 |

Categories:

VI-A Gray Infrastructure

VI-B Green Infrastructure

VI-C General Stormwater Management

Notes:

NR = not reported.

American Samoa, Guam, Hawaii, Mississippi, and Northern Mariana Islands did not submit stormwater needs.

Table B-4. 2022 CWNS Reported Needs for NPS Control by Category and State (January 2022 Dollars in Millions)

| State | Needs Category | | | | | | | | | | | Total VII |
|----------------------|----------------|-------|---------|-------|--------|-------|-------|-------|-------|----------|---------|-----------|
| | VII-A | VII-B | VII-C | VII-E | VII-F | VII-G | VII-H | VII-I | VII-J | VII-K | VII-M | |
| Alabama | \$269 | NR | \$8 | NR | NR | NR | NR | NR | NR | NR | NR | \$277 |
| Alaska | NR | NR | NR | NR | \$2 | NR | NR | \$4 | \$12 | NR | NR | \$19 |
| American Samoa | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Arizona | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Arkansas | \$657 | \$99 | \$6 | NR | NR | NR | NR | NR | NR | \$179 | NR | \$942 |
| California | \$406 | \$27 | \$6,625 | \$1 | <\$0.5 | NR | NR | NR | NR | \$1,013 | \$1,143 | \$9,215 |
| Colorado | \$141 | \$11 | \$4,444 | \$18 | NR | \$1 | NR | \$22 | \$5 | \$276 | \$3 | \$4,921 |
| Connecticut | \$2 | \$7 | NR | NR | NR | NR | \$5 | NR | \$9 | NR | \$23 | \$46 |
| Delaware | \$110 | NR | <\$0.5 | NR | NR | NR | NR | NR | NR | NR | NR | \$110 |
| District of Columbia | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Florida | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$854 | \$17 | \$871 |
| Georgia | \$10 | \$4 | NR | NR | NR | NR | NR | NR | \$14 | \$232 | NR | \$259 |
| Guam | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Hawaii | NR | NR | NR | \$52 | NR | NR | NR | NR | \$22 | NR | NR | \$74 |
| Idaho | \$370 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$370 |
| Illinois | \$3,213 | NR | \$1 | NR | NR | NR | NR | NR | NR | \$12 | NR | \$3,227 |
| Indiana | \$1,977 | NR | \$3 | NR | NR | NR | \$19 | NR | NR | \$7 | NR | \$2,006 |
| Iowa | \$2,685 | \$86 | NR | NR | NR | NR | NR | NR | \$54 | \$902 | NR | \$3,727 |
| Kansas | \$1,081 | NR | NR | \$1 | NR | NR | NR | NR | NR | NR | NR | \$1,082 |
| Kentucky | \$882 | NR | \$3 | NR | NR | NR | NR | NR | NR | NR | NR | \$886 |
| Louisiana | \$310 | NR | \$4 | NR | NR | NR | NR | NR | NR | \$13,324 | \$8,395 | \$22,032 |
| Maine | \$74 | \$226 | \$15 | NR | NR | NR | NR | NR | \$7 | NR | NR | \$322 |
| Maryland | \$279 | \$26 | \$3 | NR | NR | \$14 | NR | NR | NR | \$1,888 | NR | \$2,211 |

| State | Needs Category | | | | | | | | | | | Total VII |
|--------------------|----------------|--------|---------|--------|-------|---------|-------|-------|-------|---------|--------|-----------|
| | VII-A | VII-B | VII-C | VII-E | VII-F | VII-G | VII-H | VII-I | VII-J | VII-K | VII-M | |
| Massachusetts | <\$0.5 | \$63 | <\$0.5 | NR | NR | NR | NR | \$58 | \$7 | \$2,443 | NR | \$2,571 |
| Michigan | \$622 | \$102 | \$9 | NR | NR | \$1,476 | NR | NR | NR | \$1,546 | NR | \$3,755 |
| Minnesota | \$80 | \$16 | \$12 | <\$0.5 | NR | NR | NR | NR | NR | \$146 | NR | \$254 |
| Mississippi | \$623 | NR | \$5 | NR | NR | NR | NR | NR | NR | NR | NR | \$628 |
| Missouri | \$1,146 | <\$0.5 | NR | NR | NR | NR | NR | NR | \$3 | \$123 | NR | \$1,273 |
| Montana | \$15 | NR | NR | NR | NR | NR | NR | NR | \$1 | \$2 | NR | \$18 |
| Nebraska | \$941 | NR | NR | NR | NR | NR | NR | \$49 | NR | NR | NR | \$990 |
| Nevada | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$6 | NR | \$6 |
| New Hampshire | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$37 | NR | \$37 |
| New Jersey | \$113 | NR | NR | \$384 | \$23 | NR | \$656 | \$1 | \$432 | \$266 | NR | \$1,875 |
| New Mexico | \$763 | \$32 | \$4,254 | NR | NR | \$1,547 | \$4 | \$143 | \$13 | \$379 | NR | \$7,134 |
| New York | \$50 | \$94 | NR | \$22 | NR | NR | NR | NR | \$1 | \$78 | \$7 | \$252 |
| North Carolina | \$870 | NR | \$20 | NR | NR | NR | NR | NR | NR | \$311 | NR | \$1,201 |
| North Dakota | \$917 | \$38 | NR | NR | NR | NR | \$8 | NR | \$15 | \$279 | NR | \$1,256 |
| N. Mariana Islands | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Ohio | \$1,600 | NR | \$6 | NR | NR | NR | NR | NR | NR | NR | NR | \$1,606 |
| Oklahoma | \$268 | NR | \$1 | NR | NR | NR | NR | NR | NR | \$56 | NR | \$325 |
| Oregon | \$1,126 | \$1 | \$11 | NR | NR | NR | \$4 | NR | NR | \$148 | <\$0.5 | \$1,291 |
| Pennsylvania | \$858 | \$968 | \$1 | NR | NR | \$8 | NR | NR | NR | \$726 | NR | \$2,561 |
| Puerto Rico | \$1 | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$11 | \$12 |
| Rhode Island | NR | NR | NR | \$9 | NR | NR | \$3 | NR | \$32 | \$11 | \$2 | \$58 |
| South Carolina | \$338 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | \$338 |
| South Dakota | \$593 | NR | <\$0.5 | NR | NR | NR | NR | NR | NR | \$3 | NR | \$597 |
| Tennessee | \$593 | NR | \$2 | NR | NR | NR | NR | NR | NR | NR | NR | \$596 |

| State | Needs Category | | | | | | | | | | | Total VII |
|-------------------|-----------------|----------------|-----------------|--------------|-------------|----------------|--------------|--------------|--------------|-----------------|----------------|-----------------|
| | VII-A | VII-B | VII-C | VII-E | VII-F | VII-G | VII-H | VII-I | VII-J | VII-K | VII-M | |
| Texas | \$1,319 | NR | NR | NR | NR | NR | NR | NR | NR | \$87 | NR | \$1,407 |
| Utah | \$6 | \$4 | \$1 | NR | NR | \$8 | NR | NR | NR | \$37 | NR | \$55 |
| Vermont | \$293 | NR | \$220 | NR | NR | NR | NR | NR | NR | \$276 | NR | \$789 |
| Virgin Islands | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Virginia | \$185 | \$165 | \$68 | NR | NR | NR | NR | NR | NR | \$484 | NR | \$902 |
| Washington | \$72 | \$48 | \$59 | \$4 | <\$0.5 | NR | NR | NR | NR | \$2,264 | \$305 | \$2,753 |
| West Virginia | NR | NR | \$1 | NR | NR | \$58 | NR | NR | NR | \$4,700 | NR | \$4,758 |
| Wisconsin | \$1,748 | \$24 | \$7 | NR | NR | NR | \$108 | NR | \$6 | \$377 | NR | \$2,270 |
| Wyoming | \$31 | NR | NR | \$20 | NR | NR | NR | NR | \$137 | \$18 | NR | \$206 |
| Total U.S. | \$27,635 | \$2,042 | \$15,792 | \$513 | \$26 | \$3,111 | \$807 | \$275 | \$771 | \$33,490 | \$9,906 | \$94,367 |

Categories:

VII-A Agriculture (Cropland)

VII-B Agriculture (Animals)

VII-C Silviculture

VII-E Groundwater Protection (Unknown Source)

VII-F Marinas

VII-G Resource Extraction

VII-H Brownfields/Superfund

VII-I Storage Tanks

VII-J Sanitary Landfills

VII-K Hydromodification

VII-M Other Estuary Management Activities

Notes:

NR = not reported.

NR = not reported.

American Samoa, Arizona, District of Columbia, Guam, Northern Mariana Islands, and Virgin Islands did not submit Category VII needs.

Appendix C: Total Needs by State for 2008, 2012, and 2022

Table C-1. 2008, 2012, and 2022 CWNS Reported Needs by State (January 2022 Dollars in Millions)

| State | 2008 Reported Needs | 2012 Reported Needs | 2022 Reported Needs |
|----------------------|---------------------|---------------------|---------------------|
| Alabama | \$5,885 | \$3,835 | \$4,026 |
| Alaska | NR | \$246 | \$775 |
| American Samoa | NR | NR | \$30 |
| Arizona | \$6,955 | \$8,403 | \$4,784 |
| Arkansas | \$625 | \$886 | \$5,453 |
| California | \$39,780 | \$32,535 | \$65,533 |
| Colorado | \$1,958 | \$5,821 | \$19,170 |
| Connecticut | \$4,751 | \$5,742 | \$9,825 |
| Delaware | \$295 | \$255 | \$1,265 |
| District of Columbia | \$3,385 | \$3,469 | \$2,220 |
| Florida | \$26,024 | \$22,844 | \$46,559 |
| Georgia | \$118 | \$3,372 | \$25,569 |
| Guam | \$484 | \$495 | \$479 |
| Hawaii | \$2,337 | \$2,687 | \$3,336 |
| Idaho | \$1,831 | \$1,710 | \$2,586 |
| Illinois | \$23,279 | \$8,106 | \$11,375 |
| Indiana | \$9,470 | \$8,880 | \$10,132 |
| Iowa | \$4,561 | \$3,023 | \$12,299 |
| Kansas | \$4,317 | \$4,671 | \$4,239 |
| Kentucky | \$2,816 | \$7,744 | \$7,483 |
| Louisiana | \$5,363 | \$5,533 | \$26,904 |
| Maine | \$1,371 | \$1,203 | \$3,995 |
| Maryland | \$11,265 | \$12,309 | \$10,657 |
| Massachusetts | \$10,575 | \$10,357 | \$21,710 |
| Michigan | \$4,941 | \$2,575 | \$15,072 |
| Minnesota | \$5,466 | \$2,963 | \$6,716 |
| Mississippi | \$1,885 | \$2,523 | \$1,933 |
| Missouri | \$7,648 | \$11,917 | \$9,102 |
| Montana | \$781 | \$450 | \$347 |

| State | 2008 Reported Needs | 2012 Reported Needs | 2022 Reported Needs |
|---------------------------------------|---------------------|---------------------|---------------------|
| Nebraska | \$4,285 | \$3,184 | \$3,171 |
| Nevada | \$ 3,874 | \$3,814 | \$531 |
| New Hampshire | \$1,661 | \$2,453 | \$4,287 |
| New Jersey | \$43,236 | \$21,677 | \$19,352 |
| New Mexico | \$ 137 | \$397 | \$12,280 |
| New York | \$39,521 | \$38,984 | \$53,917 |
| North Carolina | \$8,713 | \$6,567 | \$21,136 |
| North Dakota | NR | \$271 | \$2,621 |
| N. Mariana Islands | \$28 | NR | \$341 |
| Ohio | \$18,914 | \$18,088 | \$20,555 |
| Oklahoma | \$1,726 | \$2,989 | \$3,436 |
| Oregon | \$5,025 | \$4,821 | \$5,541 |
| Pennsylvania | \$23,859 | \$8,618 | \$12,765 |
| Puerto Rico | \$6,321 | \$3,746 | \$2,711 |
| Rhode Island | NR | \$2,383 | \$2,485 |
| South Carolina | \$753 | NR | \$7,351 |
| South Dakota | \$141 | \$206 | \$1,116 |
| Tennessee | \$1,814 | \$2,144 | \$3,852 |
| Texas | \$15,347 | \$14,668 | \$18,857 |
| Utah | \$3,909 | \$1,044 | \$9,728 |
| Vermont | \$290 | \$191 | \$2,104 |
| Virgin Islands | NR | \$47 | \$157 |
| Virginia | \$9,108 | \$8,095 | \$45,770 |
| Washington | \$6,998 | \$5,050 | \$18,627 |
| West Virginia | \$4,009 | \$4,040 | \$11,089 |
| Wisconsin | \$8,460 | \$7,848 | \$12,013 |
| Wyoming | \$207 | \$113 | \$699 |
| Total U.S. (2022 Dollars) | \$ 396,501 | \$335,996 | \$630,067 |
| Total U.S. (Base Year Dollars) | \$ 298,121 | \$270,964 | \$630,067 |

Appendix D: 2012 CWNS Reported Needs by Category

Table D-1. 2012 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)

| State | Total | Needs Category | | | | | | | | | |
|----------------------|----------|----------------|----------|--------|---------|---------|---------|---------|----------|---------|-----------|
| | | I | II | III-A | III-B | IV-A | IV-B | V | Total VI | X | Total I-V |
| Alabama | \$3,835 | \$880 | \$634 | \$444 | \$1,076 | \$490 | \$310 | NR | NR | \$2 | \$3,834 |
| Alaska | \$246 | \$168 | NR | \$1 | \$72 | \$6 | NR | NR | NR | NR | \$246 |
| American Samoa | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Arizona | \$8,403 | \$334 | \$4,079 | <\$0.5 | \$807 | \$1,154 | \$763 | NR | \$52 | \$1,213 | \$7,137 |
| Arkansas | \$886 | \$153 | \$209 | \$145 | \$126 | \$113 | \$132 | NR | \$7 | NR | \$879 |
| California | \$32,535 | \$9,750 | \$3,180 | \$165 | \$7,884 | \$1,502 | \$2,047 | \$438 | \$4,866 | \$2,704 | \$24,965 |
| Colorado | \$5,821 | \$1,795 | \$1,560 | \$90 | \$1,136 | \$170 | \$311 | NR | \$715 | \$45 | \$5,061 |
| Connecticut | \$5,742 | \$230 | \$1,145 | \$298 | \$161 | \$102 | \$124 | \$3,682 | NR | NR | \$5,742 |
| Delaware | \$255 | \$96 | \$65 | NR | \$61 | \$32 | \$2 | NR | NR | NR | \$255 |
| District of Columbia | \$3,469 | \$182 | \$229 | \$74 | \$637 | NR | \$11 | \$2,337 | NR | NR | \$3,469 |
| Florida | \$22,844 | NR | \$14,047 | \$340 | \$1,758 | \$1,282 | \$2,193 | NR | \$619 | \$2,606 | \$19,619 |
| Georgia | \$3,372 | \$113 | \$2,390 | \$1 | \$348 | \$43 | \$468 | NR | NR | \$10 | \$3,362 |
| Guam | \$495 | \$206 | NR | \$11 | \$171 | \$101 | \$5 | NR | NR | NR | \$495 |
| Hawaii | \$2,687 | \$1,079 | \$20 | \$191 | \$785 | \$73 | \$444 | NR | NR | \$96 | \$2,591 |
| Idaho | \$1,710 | \$520 | \$759 | \$48 | \$131 | \$124 | \$99 | NR | \$27 | \$1 | \$1,682 |
| Illinois | \$8,106 | \$3,579 | \$277 | \$286 | \$1,104 | \$316 | \$412 | \$2,024 | \$109 | NR | \$7,998 |
| Indiana | \$8,880 | \$1,070 | \$802 | \$347 | \$527 | \$838 | \$1,069 | \$4,027 | \$200 | NR | \$8,681 |
| Iowa | \$3,023 | \$391 | \$781 | \$186 | \$809 | \$161 | \$168 | \$457 | \$68 | \$3 | \$2,952 |
| Kansas | \$4,671 | \$737 | \$1,241 | \$752 | \$476 | \$40 | \$684 | \$679 | \$62 | <\$0.5 | \$4,609 |
| Kentucky | \$7,744 | \$1,089 | \$518 | \$491 | \$1,745 | \$1,957 | \$670 | \$1,171 | \$104 | NR | \$7,640 |
| Louisiana | \$5,533 | \$2,054 | \$135 | \$161 | \$1,650 | \$1,074 | \$259 | NR | \$198 | \$2 | \$5,332 |

| State | Total | Needs Category | | | | | | | | | |
|--------------------|----------|----------------|---------|---------|---------|---------|---------|---------|----------|-------|-----------|
| | | I | II | III-A | III-B | IV-A | IV-B | V | Total VI | X | Total I-V |
| Maine | \$1,203 | \$265 | \$14 | \$44 | \$184 | \$149 | \$83 | \$465 | NR | NR | \$1,203 |
| Maryland | \$12,309 | \$1,237 | \$1,594 | \$227 | \$2,863 | \$1,608 | \$395 | \$427 | \$3,935 | \$23 | \$8,351 |
| Massachusetts | \$10,357 | \$974 | \$2,466 | \$55 | \$1,754 | \$3,548 | \$72 | \$1,211 | \$250 | \$27 | \$10,080 |
| Michigan | \$2,575 | \$856 | \$3 | \$95 | \$776 | \$26 | \$34 | \$378 | \$407 | NR | \$2,168 |
| Minnesota | \$2,963 | \$938 | \$53 | \$142 | \$1,251 | \$135 | \$411 | NR | \$31 | NR | \$2,932 |
| Mississippi | \$2,523 | \$376 | \$535 | \$73 | \$540 | \$559 | \$440 | NR | NR | NR | \$2,523 |
| Missouri | \$11,917 | \$2,575 | \$368 | \$1,421 | \$431 | \$60 | \$2,816 | \$4,225 | \$20 | NR | \$11,897 |
| Montana | \$450 | \$161 | \$119 | \$29 | \$55 | \$55 | \$8 | NR | \$23 | NR | \$427 |
| Nebraska | \$3,184 | \$411 | \$157 | \$12 | \$93 | \$20 | \$332 | \$2,109 | \$51 | NR | \$3,134 |
| Nevada | \$3,814 | \$13 | \$2,130 | NR | \$356 | \$149 | \$281 | NR | \$815 | \$71 | \$2,928 |
| New Hampshire | \$2,453 | \$389 | \$455 | \$54 | \$173 | \$149 | \$143 | \$751 | \$337 | NR | \$2,116 |
| New Jersey | \$21,677 | \$2,023 | \$6,266 | \$365 | \$1,063 | \$718 | \$338 | \$9,922 | \$922 | \$60 | \$20,695 |
| New Mexico | \$397 | \$132 | \$85 | <\$0.5 | \$68 | \$77 | \$19 | NR | NR | \$16 | \$380 |
| New York | \$38,984 | \$13,824 | \$2,727 | \$334 | \$6,076 | \$5,960 | \$333 | \$6,364 | \$3,366 | NR | \$35,618 |
| North Carolina | \$6,567 | \$319 | \$2,646 | \$326 | \$599 | \$857 | \$1,551 | \$2 | NR | \$268 | \$6,300 |
| North Dakota | \$271 | \$124 | \$2 | \$14 | \$74 | \$21 | NR | NR | \$32 | \$3 | \$236 |
| N. Mariana Islands | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Ohio | \$18,088 | \$1,586 | \$457 | \$214 | \$3,880 | \$683 | \$896 | \$9,269 | \$1,103 | NR | \$1,6985 |
| Oklahoma | \$2,989 | \$410 | \$1,321 | \$144 | \$303 | \$595 | \$216 | NR | NR | NR | \$2,989 |
| Oregon | \$4,821 | \$1,683 | \$417 | \$145 | \$962 | \$431 | \$283 | \$166 | \$685 | \$49 | \$4,087 |
| Pennsylvania | \$8,618 | \$1,526 | \$951 | \$602 | \$898 | \$954 | \$183 | \$3,505 | NR | \$NR | \$8,618 |
| Puerto Rico | \$3,746 | \$842 | \$150 | \$526 | \$138 | \$1,543 | \$519 | \$29 | NR | NR | \$3,746 |
| Rhode Island | \$2,383 | \$191 | \$221 | \$29 | \$106 | \$516 | \$235 | \$1,013 | \$72 | NR | \$2,311 |
| South Carolina | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |

| State | Total | Needs Category | | | | | | | | | |
|--------------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------------------|
| | | I | II | III-A | III-B | IV-A | IV-B | V | Total VI | X | Total I-V |
| South Dakota | \$206 | \$39 | \$49 | \$8 | \$55 | <\$0.5 | \$18 | NR | \$36 | NR | \$170 |
| Tennessee | \$2,144 | \$276 | \$274 | \$360 | \$284 | \$52 | \$25 | \$648 | \$226 | \$1 | \$1,917 |
| Texas | \$14,668 | \$4,036 | \$1,075 | \$619 | \$3,091 | \$1,277 | \$1,285 | NR | \$3,206 | \$79 | \$11,383 |
| Utah | \$1,044 | \$262 | \$178 | NR | \$36 | \$277 | \$258 | NR | NR | \$32 | \$1,012 |
| Vermont | \$191 | \$84 | \$31 | \$1 | \$15 | \$43 | \$11 | \$6 | NR | NR | \$191 |
| Virgin Islands | \$47 | <\$0.5 | NR | <\$0.5 | \$47 | NR | NR | NR | NR | NR | \$47 |
| Virginia | \$8,095 | \$1,269 | \$2,019 | \$960 | \$1,394 | \$822 | \$637 | \$862 | \$99 | \$32 | \$7,963 |
| Washington | \$5,050 | \$915 | \$656 | \$86 | \$838 | \$425 | \$77 | \$1,577 | \$274 | \$202 | \$4,574 |
| West Virginia | \$4,040 | \$444 | \$254 | \$34 | \$685 | \$410 | \$274 | \$1,771 | \$167 | NR | \$3,872 |
| Wisconsin | \$7,848 | \$2,298 | \$1,769 | \$412 | \$1,559 | \$328 | \$782 | \$7 | \$694 | NR | \$7,154 |
| Wyoming | \$113 | \$23 | NR | NR | \$62 | \$1 | \$15 | NR | \$12 | <\$0.5 | \$100 |
| Total U.S. (2022 Dollars) | \$335,996 | \$64,923 | \$61,514 | \$11,364 | \$52,168 | \$32,026 | \$23,142 | \$59,523 | \$23,790 | \$7,546 | \$304,660 |
| Total U.S. (2012 Dollars) | \$270,964 | \$52,357 | \$49,608 | \$9,165 | \$42,071 | \$25,828 | \$18,663 | \$48,002 | \$19,186 | \$6,085 | \$245,693 |

Categories:

| | | | | | |
|-------|--------------------------------|-------|--|----|-----------------------|
| I | Secondary Wastewater Treatment | III-B | Sewer Replacement/Rehabilitation | V | CSO Correction |
| II | Advanced Wastewater Treatment | IV-A | New Collector Sewers and Appurtenances | VI | Stormwater Management |
| III-A | I/I Correction | IV-B | New Interceptor Sewers and Appurtenances | X | Water Reuse |

Notes:

NR = not reported.

South Carolina, American Samoa, and Northern Mariana Islands did not participate in the 2012 CWNS.

Category X, Water Reuse, was named "Recycled Water Distribution" in 2012.